

For Reference

NOT TO BE TAKEN FROM THIS ROOM

Ex LIBRIS
UNIVERSITATIS
ALBERTAENSIS





Digitized by the Internet Archive
in 2024 with funding from
University of Alberta Library

https://archive.org/details/Anderson1973_1

T H E U N I V E R S I T Y O F A L B E R T A

RELEASE FORM

NAME OF AUTHOR .Robert.William.Anderson.....
TITLE OF THESIS .The.Influence.of.Professional,.Institutional
.and.Biographical.Factors.on.the.Attitudes.
.of.Forest.Resource.Managers.in.Alberta....
DEGREE FOR WHICH THESIS WAS PRESENTED .Master.of.Science...
YEAR THIS DEGREE GRANTED .1973.....

Permission is hereby granted to THE UNIVERSITY OF
ALBERTA LIBRARY to reproduce single copies of this
thesis and to lend or sell such copies for private,
scholarly or scientific research purposes only.

The author reserves other publication rights, and
neither the thesis nor extensive extracts from it may
be printed or otherwise reproduced without the author's
written permission.

THE UNIVERSITY OF ALBERTA
THE INFLUENCE OF PROFESSIONAL, INSTITUTIONAL AND
BIOGRAPHICAL FACTORS ON THE ATTITUDES OF
FOREST RESOURCE MANAGERS IN ALBERTA

by



ROBERT WILLIAM ANDERSON

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH
IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE
OF MASTER OF SCIENCE

DEPARTMENT OF GEOGRAPHY

EDMONTON, ALBERTA

SPRING, 1973

THE UNIVERSITY OF ALBERTA
FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled THE INFLUENCE OF PROFESSIONAL, INSTITUTIONAL AND BIOGRAPHICAL FACTORS ON THE ATTITUDES OF FOREST RESOURCE MANAGERS IN ALBERTA submitted by ROBERT WILLIAM ANDERSON in partial fulfilment of the requirements for the degree of Master of Science.

ABSTRACT

A number of studies have been completed on the attitudes of various institutional and professional groups involved in rural resources management. The purpose of this study was to extend this line of research to consider forest land managers.

A total of seventy-two Provincial Public Servants involved in the management of forested lands in Alberta were interviewed to discover the extent to which their attitudes were affected by professional, institutional and biographical factors. The testing technique employed was a modified version of the Rosenzweig Picture Frustration Test supplemented by normal interview procedure.

Results indicated that professional affiliation, age, and outdoor recreational interests play significant roles in conditioning attitudes concerning forest resource management problems. The effect of institutional affiliations by comparison, appears to have been overcome through the use of interdepartmental coordinating committees. It was also found that key forest management concepts are multidimensional and evoke no common consensus as to their meaning from the resource managers who use them. Finally, as a result of the study, the picture frustration test was considered to be an acceptable instrument for measuring complex decision-making behaviour.

On the basis of these findings it was recommended that governments standardize their interpretation of key management concepts,

as well as facilitate a greater awareness on the part of forest resource managers of the various criteria available to them and the implications of their inclusion or omission in any management appraisal. These managers could profit by allowing for their evaluative biases, but, more importantly, there is a need for educational institutions to avoid the formation of these biases (or at least make the student aware of them) during the learning process.

The results of the study should prove useful to future investigators by indicating which variables must be held constant if attitudinal variations which relate to factors in the physical environment are to be most easily measured.

ACKNOWLEDGEMENTS

I would like to thank a number of people for cooperation, assistance and encouragement they afforded me during the preparation of this thesis.

Those Alberta Civil Servants with whom I had cause to deal, either for sanction of the study or for the actual interviewing itself, deserve to be commended for the high degree of cooperation and trust they extended. I wish to express my thanks to Ian MacIver and particularly my supervisor, Arleigh H. Laycock for their frequent reviews and constructive criticism. Thank you also to Jim Beck for having served on my committee.

Most especially, I am appreciative of the constant encouragement and companionship of Della Saunders. Her typing of all drafts of the thesis was, oddly enough, the least of her contributions.

TABLE OF CONTENTS

| Chapter | Page |
|---|------|
| I. INTRODUCTION..... | 1 |
| General Statement of the Problem..... | 2 |
| Study Objectives..... | 4 |
| Study Group..... | 6 |
| Definitions and Concepts..... | 7 |
| Textual Organization..... | 9 |
| References and Footnotes..... | 11 |
| II. FOREST LAND USE POLICY IN ALBERTA..... | 12 |
| The Federal Management Era..... | 13 |
| Early Provincial Control..... | 15 |
| Post War Provincial Policy..... | 17 |
| The Administration of Forested Lands in Alberta.. | 25 |
| Summary..... | 26 |
| References and Footnotes..... | 28 |
| III. PROFESSIONAL AND INSTITUTIONAL ATTITUDES OF RESOURCE MANAGERS..... | 32 |
| The Perception Tradition in Geography..... | 33 |
| Development..... | 33 |
| Application..... | 34 |
| Professional and Institutional Effects on Perception in Resources Management..... | 36 |
| Differences in Attitudes Between Government Officials and the Public..... | 36 |
| Differences in Attitude by Level of Government..... | 39 |
| Institutional Effects on Attitudes..... | 41 |
| The Effect of Professional Affiliations on Attitudes..... | 43 |
| Study Orientation..... | 47 |
| References and Footnotes..... | 49 |
| IV. METHODOLOGY..... | 54 |
| Sample..... | 55 |
| Hypotheses..... | 57 |
| Questionnaire..... | 58 |
| Data Analysis..... | 63 |
| Methodological Appraisal..... | 65 |
| Mailing and Interview Questionnaires..... | 65 |
| Modified Picture Frustration Test..... | 68 |

| Chapter | | Page |
|---------|--|------|
| IV. | Attitudes Versus Actions..... | 69 |
| | Overview of Methodological Appraisal..... | 70 |
| | References and Footnotes..... | 72 |
| V. | DATA ANALYSIS..... | 75 |
| | Descriptive Findings..... | 76 |
| | Biographical Descriptors..... | 77 |
| | Occupational Motivation and Perceived Value of Prior Education and Experience..... | 82 |
| | Major Problems..... | 84 |
| | Forest Land Use Conflicts..... | 86 |
| | Multiple Use and the Perceived Homogeneity of Attitudes and Opinions..... | 89 |
| | Analysis of Picture Frustration Results..... | 95 |
| | Summaries of Individual Cartoons..... | 95 |
| | Frequency of Occurrence of Response Types by Professional Education..... | 104 |
| | Frequency of Occurrence of Response Types by Agency..... | 109 |
| | Frequency of Occurrence of Response Types by Age Groups..... | 114 |
| | Frequency of Response Type by Outdoor Recreation Participation..... | 117 |
| | Homogeneity of Response Types Within Agencies and Professional Groups..... | 119 |
| | References and Footnotes..... | 121 |
| VI. | SUMMARY, CONCLUSIONS AND APPLICATIONS..... | 122 |
| | Summary..... | 123 |
| | Conclusions and Applications..... | 130 |
| | Conclusions - Modified Picture Frustration Test.. | 135 |
| | An Overview..... | 138 |
| | References and Footnotes..... | 140 |
| | APPENDICES..... | 141 |
| | APPENDIX A Interview Questionnaire..... | 142 |
| | APPENDIX B Picture Frustration Coding..... | 148 |
| | Accepted Cartoons..... | 150 |
| | Rejected Cartoons..... | 156 |
| | APPENDIX C Mailing Questionnaire..... | 162 |
| | APPENDIX D Frequency of Response Types by Profes- sional Education for Individual Cartoons. | 165 |
| | APPENDIX E Frequency of Response Types by Agencies for Individual Cartoons..... | 177 |

LIST OF TABLES

| Table | | Page |
|-------|--|------|
| 1 | Age Distribution of Respondents..... | 78 |
| 2 | Professional Educational Affiliations of Respondents... | 78 |
| 3 | Professional Representation by Agency..... | 79 |
| 4 | Length of Tenure for Current Position..... | 79 |
| 5 | Age Versus Job Duration..... | 81 |
| 6 | Supplementary Occupational Experience..... | 81 |
| 7 | Proportion of Organizational Affiliations and Journals Read Which Relate Directly to Professional Education by Profession..... | 81 |
| 8 | Distribution of Outdoor Recreation Scores..... | 81 |
| 9 | Valuable Knowledge or Experience..... | 83 |
| 10 | Major Reason for Entering Present Field..... | 83 |
| 11 | Major Problems Relating to Management of Forested Lands..... | 83 |
| 12 | Rank Forest Management Problems Relative to Others..... | 85 |
| 13 | Rank of Forest Management Problems by Agency..... | 85 |
| 14 | Increasing Concern over Conflicts..... | 85 |
| 15 | Definition of Forest Land Use Conflict..... | 88 |
| 16 | Source of Awareness for Conflicts..... | 88 |
| 17 | Most Important Criteria..... | 88 |
| 18 | Definition of Multiple Use..... | 90 |
| 19 | Worth of Multiple Use..... | 90 |
| 20 | Concern over Conflicts Justified Versus Worth of Multiple Use..... | 90 |
| 21 | Application of Multiple Use in Alberta Successful?..... | 90 |

| Table | | Page |
|-------|--|------|
| 22 | Major Barriers to Successful Application of Multiple Use in Alberta..... | 92 |
| 23 | Outlooks and Opinions of Agency Members..... | 92 |
| 24 | Average Perceived Similarity of Outlooks and Opinions of Agency Members by Agency..... | 94 |
| 25 | Frequency of Occurrence of Response Types Expressed as Aggregate and as Percent of Total Sample..... | 96 |
| 26 | Frequency of Occurrence of Response Types by Professional Education for all Cartoons..... | 105 |
| 27 | Frequency of Occurrence of Response Types by Government Agency for all Cartoons..... | 112 |
| 28 | Frequency of Occurrence of Response Types by Age Groups..... | 115 |
| 29 | Frequency of Occurrence of Response Types for Cartoon Number 13 by Outdoor Recreation Score and for Cartoon Number 17 by Participation in Hunting and Fishing..... | 118 |
| 30 | Homogeneity of Response Within Agencies for Each Cartoon..... | 120 |
| 31 | Perceived and Measured Levels of Agency Homogeneity - Comparative Ordering..... | 94 |
| 32 | Homogeneity of Response Within Professional Groups for Each Cartoon..... | 120 |

CHAPTER I

INTRODUCTION

GENERAL STATEMENT OF THE PROBLEM

Probably one of the most important and pressing concerns in contemporary Alberta is the ever-increasing demand for the use and/or conservation of natural resources in forested areas. Public involvement is indicated in the large number of environmentally concerned public pressure groups actively seeking to affect resource management policy in the province.¹ Government recognition of the situation has led not only to alterations in administrative structure and organization designed to accommodate new uses of forested land and to integrate them with more traditional uses, but also an upcoming public hearing on forest utilization and its environmental effects.²

The increase in demand is partly attributable to the rapid escalation in rates of exploitation of the more traditional products of forested areas in Alberta, such as timber and minerals. However, it is the explosion of demands newly placed upon these lands over the past twenty or so years which has contributed most to current difficulties. Higher standards of living have resulted in an ever greater emphasis on quality of experience as opposed to simply material welfare.³ This trend has caused an unprecedented upsurge in demand for high quality recreational experience as well as a grave concern over any such activities as might jeopardize its availability (hence the growing emphasis on management for watershed protection, aesthetics, wildlife and recreation, in addition to strengthened controls on traditional forest operations.)

The rapid proliferation and growth of demands on forested lands have presented the Provincial Government with the potential for countless conflicts of resource use on the Crown lands they administer. Both legislation and administrative structure have been amended to aid in solution of these problems, but many difficulties remain.

The choices among uses, use priorities, and modes of user conciliation remain essentially value judgements and the question naturally arises as to suitable types of training and education for resource managers who make these decisions. Foresters have perhaps been the most severely criticized for deficiencies in this respect⁴ (due perhaps to the fact that they have traditionally managed the forested areas of Alberta), but they are not the only profession which has recognized the need to make accommodations in the hope of overcoming narrowness of perspective.⁵

The Provincial Government has, in large part, overcome this obstacle through instituting a system of interdepartmental and interdivisional committees at the senior level. The advantages for cooperation and conciliation which this approach represents should not be underestimated. However, the extent to which mutual understanding of different viewpoints and objectives is facilitated remains in question. Past studies have indicated that by the time an individual has reached the upper echelons of an organization that his perceptual horizons have undergone considerable constriction.⁶

In order that this mutual understanding occur, it is essential that a manifold perspective be instilled at any early point in the individual's career; at a level or organization where there is currently little formal interdepartmental communication.⁷

Such an initiative would reap immediate as well as long term benefits in that agency proposals would be designed for integrated use initially (at the lower levels in the administrative structure), thus eliminating the inefficiencies of the current procedure of conciliating largely single use proposals at higher levels.

A major step toward this end should be a documentation of the various ways in which institutional, professional and biographical factors affect attitudes towards specific problems in forest resource management. It is to this end that the research at hand was aimed.

STUDY OBJECTIVES

The general objective of the study is to sample various attitudes and opinions held by Alberta Civil Servants who are charged with the management of forested lands in the province. The primary aim was to investigate the extent to which professional, institutional and biographical factors (chiefly age and recreational interests) influence respondents' perception of land management problems and solutions thereto.

The author's intention is not only to examine the degree to which similarities are evident within professional and organizational groups, but also to compare attitudinal variations between groups and the extent to which commonly held attitudes are affected by dispersion of group members (that is, the degree to which people with common professional ties are dispersed within the organizational structure). A further objective was to discover which factors are most often associated with solutions stressing user conciliation.

The study was also designed to discover the degree of agreement over the definition of such basic terms as "multiple use" and "land use conflict", it being hypothesized that varying interpretations thereof may present a formidable barrier to the mutual understanding of management problems by resource managers.

In more precise form then, the major hypotheses to be confirmed were as follows:

1. responses to particular resource management problems are related to professional training, institutional surroundings and biographical characteristics of the respondents.
2. attitudinal similarities will be greater within institutional groups than within professional groups.
3. group perceptions will be most pronounced when a particular type of professional dominates an institutional group.
4. criteria for the resolution of forest management problems are either poorly defined or divergent and the terms "multiple use" and "use conflict" have no generally accepted meanings.
5. perceived importance of forest management problems will vary directly as the degree of involvement of the respondent's agency with such matters.
6. forest resource managers' appraisal of the degree of opinion conformity within the agencies in which they are employed will bear no meaningful correlation with sampled levels of conformity.

STUDY GROUP

Individuals were chosen as respondents on the dual basis of seniority of position and preoccupation with the management of forested lands. There was a conscious attempt made to exclude those whose sphere of activity was sufficiently constricted to make significant portions of the interview hypothetical. Cooperation was high and interview refusals infrequent.

The various divisions of the government which were sampled include: the Interdepartmental Planning and Water Resources Division and the Environment Conservation Authority of the Department of the Environment; the Forestry, Fish and Wildlife, Provincial Parks and Lands Divisions of the Department of Lands and Forests; as well as the Minerals Division of the Department of Mines and Minerals; and the Provincial Planning Branch of the Department of Municipal Affairs. For analytical purposes respondents from the Alberta Forest Service (Forestry Division) were further divided according to either the Timber Management Branch, the Forest Land Use Branch or the Multiple Land Use Section. Two further groupings included within the sample are the (interdepartmental) Land Use Assignment Committee and the Strip Coal Advisory Committee.

The sample was not intended to exhaust the entire array of agencies involved with the management of forested lands in Alberta, but it was designed to include groups with varying degrees of commitment to, and involvement in, that activity. Professional groups which figure prominently in the sample include Foresters, Agriculturalists, Geographers and Biological Scientists. Sample comparisons

will also be examined on the basis of age and outdoor recreational activity.

DEFINITIONS AND CONCEPTS

For purposes of clarification, the following definitions and explanations are offered for controversial key terms of a nature which recur frequently within the text:

1. Forested land: is taken here in a broad context to include not only land which strictly possesses forest cover but also non-forested lands adjoining the forested area and lying within it. It also includes indigenous water bodies, areas where forest cover is sparse and non-commercial as well as burned and cleared plots. As such, activities which take place within the general locus of forested land but within clearings, are considered forest activities.
2. Forest land use conflict: a dispute relating to the use, priority of use, or means of user conciliation on lands previously defined as forested. In most cases the attainment of one goal will not completely exclude the attainment of another, but will physically interfere with it. Conflicts are potentially multidimensional in that they may manifest themselves on any of three planes: 1) at the level of pure demand, where social groups vie competitively for differing forms of land use or products therefrom; 2) at the administrative level, where the assignment of specialized responsibilities results in disputes between agencies charged with the management of different land uses on the same tract of

land; and 3) at the ground level, where two or more uses when placed in juxtaposition act upon each other to the detriment of one or more of the interests involved.

3. Multiple use management: is defined here as the management of land units by any strategy ranging from coincidental to single use in keeping with whichever is most desirable in light of ecological constraints and society's current and projected valuations. The concept of multiple use does not necessarily entail the management of each individual land unit for more than one use, but does imply that multiple uses are being realized when the management area is taken as a whole. Complete multiple use management involves planning for a sequence of uses through time as well as a minimum of conflict between adjacent land use units in space. Implicit is the assumption that it is impossible to obtain a maximum yield of every one of the forest's potential benefits on every land unit. Only certain combinations of uses will exceed in desirability the most desirable form of single use management (if indeed any do at all), and these must, for efficiency's sake, assume differing levels of ascendancy.⁹

The remaining definitions are essentially consistent with those proposed by Schiff.¹⁰

4. Attitude: is a collection of feelings (i.e., likes and dislikes) and beliefs about an object (and its relationships with other objects) which taken together predispose an individual to react to that object in a certain way.

5. Perception: (that is, social perception) is the act of becoming aware of a physical or symbolic stimulus. The way in which the perceiver sees the stimulus will be influenced by its nature, its interaction with relevant attitudes held by the individual and the perceiver's mood at the time of exposure.
6. Opinion: is the culmination of a rational analysis of a situation which has been encountered in either physical or symbolic terms. It involves a synthesis of all the attitudinal components which relate to objects existing in a given situation and results in the compound formulation of feelings, beliefs and predispositions to act in response to such a situation. Opinion formation differs from perception chiefly in the greater depth of thought and the complexity of the stimulus involved.

TEXTUAL ORGANIZATION

The remainder of the text is organized for successive presentation of problem orientation, relevant research, methodology and conclusions. Chapter Two is a review of the legacy of forest management policies and administrative structures through which the province has passed as well as the current situation. In Chapter Three the place of perception studies in Geography is investigated including a brief review of research completed to date on the environmental perception of professional and institutional groups. Chapter Four is a description of the study methodology and includes a critical appraisal of questionnaire and methodological weaknesses. Chapter

Five is designed to present a description and analysis of findings, while the final chapter provides an overall summary and conclusions as to the applicability of the results and suggestions for further research.

REFERENCES AND FOOTNOTES

- 1 See for instance: Environmental Groups In Alberta, compiled by K.R. Persson, Information Division, Alberta Dept. of the Environment, Edmonton, 1972, 27 p.
- 2 For tentative guidelines see: Tentative Terms of Reference, Public Hearings on Forest Utilization and Its Environmental Effects, circulated by the Environment Conservation Authority, 1972, 3 p.
- 3 For an effective elaboration see: J. Allan Wagar, "Growth Versus the Quality of Life", Science (1970), Vol. 158, pp. 1,179-1,184.
- 4 See for instance: Charles A. Connaughton, "The Revolt Against Clearcutting", Journal of Forestry (1970), Vol. 68, pp. 264-265; Paul O. Rudolf, "Silviculture for Recreation Area Management", Journal of Forestry (1967), Vol. 65, pp. 385-390; or E.M. Gould, "The Future of Forests in Society", Forestry Chronicle (1964), Vol. 40, pp. 431-444.
- 5 An excellent example of such response is found in: Lawrence S. Davis & W.R. Bentley, "The Separation of Facts & Values in Resource Policy Analysis", Journal of Forestry (1967), Vol. 65, pp. 612-620.
- 6 See for example: J.E. McMeiken, "Public Health Officials and the Environment: A Study of Perceptions and Attitudes", Unpublished Master's Thesis, University of Victoria, 1970; or Edmund M. Ricci, "Organizational & Professional Influences Upon Work Role Conception and Work Interaction", Unpublished Ph.D. Dissertation, University of Pittsburg, 1967. For further elaboration on this and related questions see Chapter Three.
- 7 As evidenced in administrative conventions, see for instance: K.P. Smith (ed.) Land Related Program Descriptions, compiled for the Alberta Department of the Environment, 1972.
- 8 Albert C. Worrell, Principles of Forest Policy, McGraw-Hill Book Company, Toronto, 1970, p. 20.
- 9 Ibid., p. 14.
- 10 Schiff, Myra R., "Some Theoretical Aspects of Attitudes and Perceptions", Natural Hazards Research Paper No. 15, University of Toronto, Department of Geography, Toronto, 1970.

CHAPTER II

FOREST LAND USE POLICY IN ALBERTA

Alberta has a total land area of approximately 248,800 square miles. Sixty-three percent of this total (or 157,595 square miles) may be classified as forested, and forty-eight percent (or 116,572 square miles)¹ is considered commercially productive for forestry purposes. Total merchantable timber has been estimated at fifty-five billion cubic feet. In these last two respects Alberta ranks fourth among the provinces behind British Columbia, Quebec and Ontario.² Forestry, however, plays only a minor role in the provincial economy (accounting for only .2% of total value added of goods-producing industries)³ and will no doubt be eclipsed, if such is not already the case, by recreational activities in the use of forested lands. The mineral industry, the bulk of which is situated in forested areas, accounted for over a billion dollars value added in 1968, or 34.4% of the provincial total. Similarly, electrical power accounted for 2.9%. In light of these facts it is understandable that the forested areas of the province figure prominently in Alberta's social and economic welfare. The manner in which this resource has been valued and managed has, however, varied considerably through the years.

THE FEDERAL MANAGEMENT ERA (1869-1930)

For the two hundred years preceding 1869, the area presently comprising Alberta was administered by the Hudson's Bay Company as part of the broader geographic division of Rupert's Land. The forest policy during this period was one of forced exclusion of settlement

and its attendant exploitations due to the adverse effects they tended to have on the fur trade.

The transfer of Rupert's Land to Canadian control in 1869 marked an abrupt change in the direction of western land policy. In response to the territorial aspirations of the United States, the Canadian Government focused on three major objectives:⁴

1. to promote rapid agricultural settlement
2. to encourage railway construction through land grants
3. to create a consuming public and supplier of raw materials for Eastern manufacturers

These goals reflected an attitude towards forests which was to continue well into the twentieth century. Land policy developed around the single purpose of quantitative agricultural settlement. The settler was regarded as exclusively important to the development of the country and his satisfaction was regarded as a matter of right. Forests were considered a passing phenomenon and occupied only those lands which had not yet been required for agricultural production.⁵

In the 1870's and 1880's, Alberta witnessed a considerable influx of settlers accompanied by an increased demand for forest products. Timber cutting rights were first sold in Alberta in the 1880's. Licenses were awarded over large areas to the highest bidder and sales were based on cruise estimates which were usually very low. Although 1899 was marked by the initial appointment of a Chief Inspector of Timber and Forestry (responsible for the inspection and recommendation of forest reserves and the recommendation of improved fire protection), provincial authorities who followed considered this period of federal

jurisdiction to be characterized by frequent abuses of timber rights and an overall lack of control.⁶

The first evidence of real concern for the management of forested lands came in 1906 when Parliament passed the Forest Reserves Act.⁷ The objectives of the new act were, firstly, to reserve timber supplies for more intensive management and protection, secondly, to withdraw areas unsuitable to agriculture, and lastly, to safeguard streamflow rising in the upper watersheds of western Canada. By 1913, five reserves had been formed: Cypress Hills, Elk Island, Cooking Lakes, Eastern Rockies and Lesser Slave Lake. Grazing of livestock was allowed and two hundred permits were issued annually for fifteen to twenty thousand head of stock. Policy emphasis during this latter part of the federal era was on improved fire protection and access.

EARLY PROVINCIAL CONTROL (1930-1945)

Although Alberta was accorded provincial status in 1905, it was not until 1930 that its growing demands for the transfer of jurisdiction over natural resources were met. (Administrative revenues to the federal government had declined considerably since the major surge of settlement, thereby making effective management difficult.) The new Department of Lands and Mines, formed predominantly of the administrative structure and personnel transplanted from its federal predecessor, found itself responsible for 148,000 square miles of the Northern Alberta Forest District, in addition to fourteen thousand square miles of Forest Reserves.⁸

Management initiatives throughout the 1930's were preoccupied with fire protection and the administrative problems associated with the changeover. Economic depression practically terminated

timber exploitation and fires kept personnel from examining stocks. Ever increasing annual fire losses led to pleas on the part of the Deputy-Minister (1938) for an augmented and better financed staff to reflect the important role forests play in regulating streamflow and, hence, the protection of wildlife, urban sanitation and industrial prosperity.⁹ Regulations were generally tightened under the new provincial administration. Maximum stump height was reduced from eighteen to twelve inches and a program aimed at reducing fire hazard through public education and strict control of camping and travelling was inaugurated. The serious slump in the timber industry made greater levels of utilization the major policy objective in pre-war years.

Paradoxically, the Second World War created such a sharp increase in demand that the need to implement conservation measures should the pace continue unabated was quickly recognized.¹⁰ Manpower shortages not only attracted many inexperienced timber operators into the industry but also made observation and regulation of operations very difficult. In local areas sustained yield was forced to give way to the temporarily higher end of contributing to the war effort.

The excesses of the war years led to growing levels of concern not only for a continuing flow of timber but also the attendant problems of soil erosion, environmental deterioration due to strip mining, wasteful methods of timber harvest and excessive clearing for settlement.¹¹ The lumber boom continued following World War II and by 1946 a four-fold increase in production had been achieved over the total eleven years previous. Regional overcut was accompanied by the prospect of a new pulp and paper industry, and the discovery of

large oil reserves in the late 1940's and early 1950's to make comprehensive data of forest resources an urgent requirement.

POST WAR PROVINCIAL POLICY

The Post War Reconstruction Committee presented a number of important recommendations concerning forestry:¹²

1. the vast fire losses of the previous decade should be countered with expanded management efforts.
2. if proper utilization and conservation were to occur, an inventory of stock and physical potential was essential.
3. marginal and submarginal agricultural lands should be withdrawn from settlement and forested with the best suited species.
4. the large areas of over mature timber in the province should be made accessible for harvest.
5. the practicality of establishing pulp mills and utilizing birch and poplar to support a plywood industry should be investigated.
6. the Rocky Mountain headwaters of east-flowing rivers should be managed more intensively for water yield.

These recommendations were to play an important role in guiding the management of Alberta forests through the succeeding years.

Creation of the Eastern Rockies Forest Conservation Board in 1947 represented an important turning point in Alberta forest management policy with the formal recognition of watershed values. The Board was to be jointly financed by the federal and provincial governments and was to be responsible for administration of the

Crowsnest, Bow River and Clearwater Forest Reserves. Its objectives were to provide watershed protection, expand fire protection facilities, explore methods of forest administration and regeneration, and generally manage the area for whatever uses were demanded of it. Specifically with regard to watershed management, its goals were to reduce the spring flood peak and maintain the maximum flow possible during summer.¹³

The same year also marked the initial delineation of the Green Zone. On the dual basis of value of standing timber and soil quality, approximately two-thirds of the province were deemed unsuitable for agriculture. The zoning represented an effort to reduce fire hazard and restrict settlement to areas where social services were reasonably available, as well as making possible the long term management of forested areas for sustained yield.¹⁵ Detailed soil investigation carried out by the Alberta Research Council from 1955 to 1964 resulted in boundaries being adjusted accordingly.

In 1949 a massive campaign of aerial photography was initiated of Alberta forests. By 1962 complete forest inventory maps and timber volume estimates existed for 150,000 square miles of the province.¹⁶ The accumulated information revealed that the legacy of poorly controlled exploitation and fire damage was a relatively poor age/class distribution,¹⁷ but it also provided the necessary foundation for sustained yield management. Forest cover maps have enabled a more efficient location of access roads and lookout towers to protect high value and risk areas. The inventory has uncovered new areas of timber suitable for the development of both saw-mill

and pulpwood industries, and has indirectly facilitated rural socio-economic stability by making possible a continuous supply of raw materials from each producing unit.

The most recent and comprehensive survey of the forested area is that administered under the auspices of the Canada Land Inventory. It includes capability maps for agriculture, forestry, wildlife and recreation, and the data are to be used for the planning of all marginal and submarginal agricultural lands.

The early 1950's witnessed a growing and impressive demand for recreational opportunities in the eastern Rockies reserves. By way of illustration, in the eight years between 1953 and 1961, the number of registered travellers in the Bow River Forest approximately quadrupled to 150,000. New or upgraded access routes (n.b., Forestry Trunk Road from Coleman to Nordegg constructed by the Eastern Rockies Forest Conservation Board and beyond to Grande Prairie by the Alberta Forest Service) were consistently accompanied by new surges in recreational use. Management responded with an escalated effort to instill a strong fire consciousness in all those who entered the forested areas. By the early 1960's, public acceptance of forest closure due to fire hazard and the public's overall cooperation in matters relating to fire prevention, received praise from the Eastern Rockies Forest Conservation Board.¹⁸

Over the province as a whole, residents showed a tremendous increase of interest in hunting and angling. Between 1950 and 1960, the number of resident bird game licenses purchased increased to three times their previous number (36,308 to 104,123), big game license sales increased to five times their 1950 total (12,732 to 62,116) and angling licences, six and one-half times (20,839 to 135,243).

The increase in angling pressure was to some extent offset by growing interest in the coarser varieties of fish,¹⁹ and management efforts to further cultivate these species.²⁰ Experiments with lakes close to large centres of population received a very favorable reaction from the public.²¹ Improved access to streams in forested and mountainous regions also assisted to some extent in alleviating angler congestion on more accessible waters,²² but by 1957, many streams were so crowded on weekends as to discourage the confirmed outdoor enthusiast.²³ By the mid-sixties, demand for sport fishing was much higher than available waters could accommodate.²⁴

The need for a change in wildlife policy was indicated in 1970 when the Director of Fish and Wildlife Division stressed the need to recognize social as well as economic values of wildlife if pressured species and habitats were to be protected and maintained.²⁵ The following year witnessed a movement in management emphasis from sustained harvest to habitat protection and development; a shift towards more conservation-oriented management and quality of recreational experience.²⁶

Another significant development of fish and wildlife management in the province has been the trend towards involvement in the disposition of Crown lands and land use practices thereon. Fishery and wildlife biologists are now responsible for recommending programs for land clearing, road construction, and the management of lands surrounding water bodies so as to minimize disruption of natural habitats and maximize their restoration.²⁷ Considerable effort is now expended to inspection of plans for coal exploration and development and the establishment of gas and other industrial plans,²⁸ as well as

research involving oil spills and seismic operations.²⁹ Other diversions from a formerly restricted management responsibility include monitoring the biological condition of major river systems,³⁰ and studying the effects of burning, logging and bulldozing on the productivity of browse ranges.³¹ Along more conventional lines, research has been intensified on recreationists, their movements and expenditures,³² and the environmental needs of various species.³³ There are also an increasing number of investigations conducted in an attempt to identify major problems facing wildlife.³⁴

Another important development conceived in the 1950's and carried on into the following decade was the growing attitude that government should itself be considered a landlord and as such strive to attain the greatest possible fibre return from the land.³⁵ This was particularly evident in the intensified management of the Eastern Rockies reserves. In 1961, the Forest Act was revised to authorize long-term forest leases, and subsequent policy (based largely on the timber quota system established in 1966) was geared to sustained yield, cutting only the yearly growth increment and ensuring reforestation at the expense of the private operator. Timber operators are annually responsible for submitting management plans which are subject to the approval of government officials. Progressive management techniques adopted included lower stumpage dues for small diameter, poor quality or remote timber as well as tax exemption on any increases in productivity facilitated by the operator.³⁶ Demand for poplar became so significant that it was necessary in 1969 to institute a quota system for it similar to that already in existence for spruce and pine (as of 1966).

The trend towards multiple use management was led by the Eastern Rockies Conservation Board with their promotion of watershed values. Included in all timber sales for the Conservation Area were clauses which prohibited streamside harvest, guaranteed the preservation of patches essential to snow accumulation and delayed snow melt, and assured clearing and protection of stream channels. It was required to construct roads and skid trails so as to minimize disturbance and stream siltation, and when closing out a timber berth, operators were obliged to put roads and skid trails "to bed" by blocking drainage and seeding to grass to avoid gulley formation.³⁷ The Conservation Board also pioneered inter-user regulations by requiring that oil and gas companies provide compensation for all timber cut or damaged in the course of their operations.³⁸

The Conservation Board has, since its inception collected data on various hydrometeorological parameters. In 1961 two experimental watersheds were inaugurated. The Marmot Creek Basin in the Kananaski Valley was to be used for gathering fundamental data on subalpine watersheds as well as applied research into timber harvest techniques which best protect watershed values. The Dry Coulee Basin in the Porcupine Hills was chosen to provide basic watershed data on forest rangeland and as a site for some applied research on the effects of vegetation manipulation on watershed values.³⁹ This type of research led to a multitude of additional projects which investigated the interrelations of various forest uses. The year 1961 also marked the beginning of a program to identify major watershed problems and determine their relative importance.⁴⁰

The 1960's and 1970's featured an increasingly intensive management of grazing areas within the Rocky Mountain Forest Reserve in addition to an expansion of surveys and planning elsewhere in the Green Zone to cope with greater demands. After expending most of its exploratory and developmental efforts in the more northern regions of the province, the oil and gas industry seems to be exhibiting a tailing-off of interest. Industrial attention to the coal reserves of Alberta's forests appears, on the other hand, to have picked up considerably in recent years. Growing public concern over possible environmental repercussions of coal development has led the Forest Land Use Branch to embark on an extensive survey of the foothills designed to provide a problem analysis upon which to base future research.⁴¹

Continuing expansion of forestry, mining and petroleum access roads and the increased use of all-terrain vehicles and aircraft have provided new access opportunities for recreationists, with remote areas experiencing the greatest proportion of change.⁴² Demand for recreational land and facilities (both public and private) has continued to grow at a rate in excess of the government's ability to provide. In 1966, the Forest Surveys and Planning Branch initiated a four-year program of recreation area development calling for planning, expansion, and redevelopment of many existing forest recreational sites. Passage of the Wilderness Act in 1971 signified official recognition that the value of recreation potential has come to be regarded as sufficient in itself to demand land allocation.

Increased recreational demand has also been the primary cause for the recent drive toward multiple use management. The

Minister of Lands and Forests now reserves all rights on forest management areas not specifically granted in order to accommodate other potential users.⁴³ The implementation of various studies begun in 1968 to improve the management of forested lands for uses other than timber production continues to date. The most recent investigation in this series was contracted in early 1973 and involved the effect of timber harvest on potential alternative uses in the foothills along the east slopes of the Rockies.⁴⁴

The Provincial Government strongly asserted its commitment to the concept of multiple use through the inauguration of (in 1969) and support for, the multidisciplinary Foothills Resource Allocation Study. Canada Land Inventory data, accumulated since 1965, is being applied to common landscape units in order to provide a basis for the most beneficial allocation of renewable resources in the region. The program is sponsored provincially by the Conservation and Utilization Committee and administered by the Alberta Department of Lands and Forests. Its execution will involve four stages:

- 1) regional land use guidelines based on present and future productivity and present policy;
- 2) regional land use guidelines based on present demand;
- 3) regional land use guidelines based on projected 25% and 50% increases in population; and,
- 4) detailed microlevel multiple use plans for present and projected demands.⁴⁵

During the last few years, the Green Zone has been used extensively for many purposes other than forestry. This has required an increased emphasis on planning and management and has necessitated a fairly intensive control of the use of lands in those areas. Current timber management policies appear to be oriented towards four

basic ends: 1) sustained yield; 2) full utilization of all ages and species; 3) increased productivity through improved regeneration; and, 4) multiple use.⁴⁶ The concept of multiple use, unfortunately, remains evasive in both its definition and implementation. Any attempt to institute a program of multiple use must necessarily be predicated upon a controversial set of value judgements, and until such time as a means of deriving a common consensus thereon is formulated, the concept will remain extensively employed but highly confusing.⁴⁷

THE ADMINISTRATION OF FORESTED LANDS IN ALBERTA

The year 1949 marked the beginning of two decades of substantial growth of forest administration in the province. The old Department of Lands and Mines which had existed since 1930 was split into two new departments; Mines and Minerals, and Lands and Forests. The Forest Act (1949) was passed to consolidate the disposal of all timber in Alberta under one authority for the first time. Other important developments in administrative structure since then have included creation of the Alberta Forest Service in 1953, the implementation of a Land Use Assignment Committee with representatives from four divisions of the Department of Lands and Forests (Alberta Forest Service, Lands, Fish and Wildlife, Provincial Parks) in addition to Water Resources, Agricultural Economics and Provincial Planning, which is responsible for determining broad land use zones, and the institution of the Land Use Branch of Lands and Forests (1970) designed to coordinate long-term planning and administration of all uses of forested land.

The Environment Conservation Authority was brought into existence in 1971 with the purpose of reviewing such governmental policies and programs related to environmental conservation and sampling relevant opinions of specialists and the public in general. Shortly thereafter, in the same year, the Department of the Environment was inaugurated to coordinate policies, programs, services and administrative procedures of government departments and agencies in matters relating to the environment. Responsibility for matters of government native to forested areas is dispersed through a large number of agencies and departments, but the greater bulk is now held by the Department of Lands and Forests with the Department of the Environment gradually increasing its influence.

SUMMARY

Forest policy in Alberta has passed through successive stages of timber preservation for single purpose (trapping) exploitation, forest liquidation, first to encourage settlement and later to enhance economic development, sustained yield, and finally, multiple use. Because of the great diversity in physiographic, geological and climatic conditions, the forested lands of the province pose considerable problems in resource allocation and integrated management.⁴⁸ Projected demands for the products of forested areas indicate that management must continue to strive towards a full implementation of multiple use concepts in the province.

Bickerstaff has contended that most of the problems posed by the integration of various uses on a particular tract of land are capable of solution through realistic planning to attain clearly formulated and compatible management objectives; the chief problem

being to develop suitable working arrangements.⁵⁰ That universally acceptable working arrangements are elusive, is indicated by difficulties experienced to date in Alberta.⁵¹ It is to be hoped that the upcoming public hearings on resource development in the Eastern Slopes and the discussion they stimulate⁵² will act as a solid foundation for the comprehensive management plan which is so badly needed in the province.⁵³

REFERENCES AND FOOTNOTES

- ¹ excludes areas incapable of producing crops of merchantable timber due to adverse climate, soil or moisture conditions, and reserve forest lands for which no inventories are available.
- ² J.H.G. Smith & Gilles Lessard, Forest Resources Research In Canada, Background study for Science Council of Canada, Special Study No. 14, Information Canada, Ottawa, 1970, pp. 31,36.
- ³ comparable percentages for British Columbia, New Brunswick and Newfoundland are 11.4, 7.1, and 4.0. All figures on value-added are from Dominion Bureau of Statistics, Canada Yearbook, 1970-1971, Information Canada, Ottawa, 1971, p. 1189.
- ⁴ V.A. Wood, "Utilization of Public Lands in Alberta", in Transcripts of Land - Forest - Wildlife Conference, 1960, p. 42.
- ⁵ See Canadian Institute of Forestry, Rocky Mountains Section, Forestry and Regional Planning in Land Use Policy for Alberta, and Some Basic Principles of Land Use Policy Particularly Applicable to Alberta, 8 p. and 15 p. respectively, 1956.
- ⁶ associated with geographical estrangement from the administrative centre in Ottawa.
- ⁷ E.S. Heustis, "The Utilization of the Forests of Alberta", in Transcripts of the Land - Forest - Wildlife Conference, 1960, p. 89.
- ⁸ Annual Report of the Alberta Dept. of Lands & Mines, 1932-1933, p. 17.
- ⁹ Annual Report of the Alberta Dept. of Lands & Mines, 1937-1938, pp. 10-11.
- ¹⁰ Annual Report of the Alberta Dept. of Lands & Mines, 1941-1942, p. 30.
- ¹¹ Annual Report of the Alberta Dept. of Lands & Mines, 1945-1946, p. 11; 1946-1947, p. 33; 1947-1948, p. 34.
- ¹² Annual Report of the Alberta Dept. of Lands & Mines, 1946-1947, p. 9.
- ¹³ Annual Report of the Alberta Dept. of Lands & Mines, 1945-1946, p. 12.
- ¹⁴ Annual Report of the Eastern Rockies Forest Conservation Board, 1950-1951, Calgary, 1951, p. 2.
- ¹⁵ V.A. Wood, "Utilization of Public Lands in Alberta", op. cit., p. 44.
- ¹⁶ Alberta Dept. of Lands & Forests, Forest Inventory, 1968, p. 5.

- 17 Ibid., p. 35.
- 18 Annual Report of the Eastern Rockies Forest Conservation Board, 1961-1962, Calgary, 1962, p. 22.
- 19 Annual Report of the Alberta Dept. of Lands & Forests, 1951-1952, p. 47.
- 20 Annual Report of the Alberta Dept. of Lands & Forests, 1952-1953, p. 55.
- 21 Annual Report of the Alberta Dept. of Lands & Forests, 1953-1954, p. 48.
- 22 Annual Report of the Alberta Dept. of Lands & Forests, 1956-1957, p. 62.
- 23 Ibid., p. 48.
- 24 Annual Report of the Alberta Dept. of Lands & Forests, 1967-1968, p. 82.
- 25 Annual Report of the Alberta Dept. of Lands & Forests, 1969-1970, p. 76.
- 26 Annual Report of the Alberta Dept. of Lands & Forests, 1970-1971, p. 89.
- 27 Annual Report of the Alberta Dept. of Lands & Forests, 1966-1967, p. 87.
- 28 Annual Report of the Alberta Dept. of Lands & Forests, 1969-1970, p. 80.
- 29 Loc. cit.
- 30 Annual Report of the Alberta Dept. of Lands & Forests, 1968-1969, p. 82.
- 31 Annual Report of the Alberta Dept. of Lands & Forests, 1970-1971, p. 106.
- 32 Annual Report of the Alberta Dept. of Lands & Forests, 1969-1970, p. 81.
- 33 Ibid., p. 89.
- 34 Ibid., p. 81.
- 35 Wood, op. cit., p. 46.
- 36 Canadian Council of Resource Ministers, Forestry: Four Surveys, Montreal, 1970, pp. 35, 40.

- 37 Annual Report of the Eastern Rockies Forest Conservation Board, 1956-1957, Calgary, 1957, pp. 20-21.
- 38 Ibid., p. 3.
- 39 Annual Report of the Eastern Rockies Forest Conservation Board, 1960-1961, Calgary, 1961, p. 10.
- 40 Ibid., p. 11.
- 41 Annual Report of the Alberta Dept. of Lands and Forests, 1970-1971, pp. 40, 46.
- 42 Annual Report of the Alberta Dept. of Lands and Forests, 1969-1970, pp. 74-75. Increased access has also caused a sharp increase in law-breakers and problems of administrative control.
- 43 Canadian Council of Resource Ministers, op. cit., p. 30.
- 44 To be conducted by a private consulting firm (C.D. Schultz and Co. from British Columbia).
- 45 Annual Report of the Alberta Dept. of Lands and Forests, 1969-1970, p. 45; 1970-1971, pp. 47-48. For further information see Multiple Use Planning Section, Foothills Resource Allocation Study Discussion Paper No. 6, A Pilot Land Use Planning Project, 1972; Hoar, G.N., Proposed Methodology Phases II, III, IV, Foothills Resource Allocation Study, 1972; or other related materials.
- 46 For the official statement of the Alberta Provincial Government see A. Bickerstaff (ed.), Multiple Use of Forested Land In Canada: A Collection of Summary Statements Provided By Provincial and Federal Agencies, Forest Management Institute, Information Report FMR - X - 20, 1969.
- 47 Environment Conservation Authority, Public Hearing on Land Use and Resource Development in the East Slopes, Announcement, October, 1972.
- 48 Environment Conservation Authority, Current Status Report on Alberta's Eastern Slopes, Information Bulletin No. 2, Edmonton, April 1973, p. 2.
- 49 See for example: G.H. Manning, "Export Demand For Canada's Pulp and Paper: 1980 and 2000"; G.H. Manning, "Domestic Demand For Canada's Forest Products: 1970 and 2000"; J. Miyazawa, "Export Demand For Canada's Softwood Lumber and Plywood: 1980 and 2000"; M. Maldague, "Use of the Forest For Wildlife and Recreation"; all in Forestry Reader, Background Papers for Forestry Seminar held 1970 in Winnipeg, Canadian Council of Resource Ministers.
- 50 Bickerstaff, A., "Forestry Considerations In Canadian Land Use Planning", Forestry Chronicle (1963), Vol. 39, No. 4, p. 381.

- 51 See for instance: Land Use Conflicts, a paper submitted to the Alberta Department of Lands and Forests by Northwest Pulp and Power, Ltd., February 27, 1963.
- 52 For a listing of publications to be circulated by the Environment Conservation Authority for purposes of orientation, see: Environment Conservation Authority, Information and Source Material for the Public Hearings on Land Use and Resource Development in the Eastern Slopes, Information Bulletin No. 3, Edmonton, April 1973.
- 53 The author acknowledges his high degree of dependence upon official reports of government agencies for the preparation of this chapter. The probable effects are that the material is somewhat dated in terms of management policy, that positive, as opposed to negative, aspects have been stressed, and that those uses incurring net revenues, rather than net costs, have received proportionally more attention.

CHAPTER III

PROFESSIONAL AND INSTITUTIONAL ATTITUDES OF RESOURCE MANAGERS

THE PERCEPTION TRADITION IN GEOGRAPHY

Development

The study of the effects of human perception on the social and economic forces which shape our environment is a logical extension of the human ecology school of geography. In the tradition of Barrows¹ it seeks to comprehend the complex and interacting relationships between man and his environment.

Several milestones in the philosophical maturation of perception research emerged from varied schools of geographic thought. In 1947 the geographical approach to man/land relationships was challenged. R.B. MacLeod, a psychologist, indicated the need for a "psychological geography" designed to investigate what the individual perceived in his environment rather than what was objectively measureable.² In the same year, J.K. Wright suggested that perhaps the most fascinating exploration that Geographers could undertake would be a study of the minds and hearts of men.³ In describing three types of perceptual bias particularly relevant to geographical research (promotional, intuitive and aesthetic imagining), he justifies his proposal to adopt the term "geosophy" to define the study of geographical knowledge: "Taking into account the whole peripheral realm, it covers the geographical ideas, both true and false, of all manner of people ... and for this reason it necessarily has to do in large degrees with subjective conceptions."⁴

In 1952 and 1963, W. Kirk argued that geographical endeavours would be most aptly classified as relating to either the phenomenal environment, the world of physical facts, or the behavioural environment, which features the mental structuring and evaluation of phenomenal facts.⁵ Also, the mutual influence of man and environment is not direct as envisaged by possibilist theories but operates through, and is transformed in, the behavioural environment.⁶ He goes on to conclude that Geographers must consider both of these environments if they hope to evolve a genuine understanding of the decision process which leads to man/land interactions.

By gathering the suggestions of Wright, considerable data on cultural variations in perception, and especially an intensive discussion of the psychological literature on perception, Lowenthal's 1961 paper, may perhaps be regarded as the real bridge between the older and modern approaches to perception in geography.⁷ In his words, "the surface of the earth is shaped by refraction through cultural and personal lenses of custom and fancy."⁸ He also indicated that scientists, as well as laymen, fall prey to the biases of human perception,⁹ an important observation in light of later attempts to isolate the presence and function of subjective biases among resource management groups.

Application

To quote Lowenthal, "the geography of the world is united only by human logic and optics."¹⁰ Prior to the behavioural revolution man was usually regarded as a "black box" concept; an unknown constant

in the study of the environment/behaviour relationship. The behavioural approach is an attempt to substitute a "white box" of more realistic assumptions about man, making man the intermediate variable in the relationship between environment and spatial behaviour.¹¹ As such, the perceived environment and environmental perception are central to our ultimate problems. We cannot pretend to understand the actions of man on the earth without some knowledge of his mental processes.¹²

Perception studies have not been free of growing pains. Environmental images and the attitudinal components of which they are comprised are extremely difficult to measure. Still in its infancy the study of geographical perception has yet to establish a concise methodology or body of theory, and the establishment of predictive models seems an even more distant goal.

For the present, further advancement must involve the borrowing of theories and techniques from other disciplines, and psychology - with its tradition of concern over measurement problems - appears to be the most fruitful source.¹³ At a later stage it will be possible to standardize the most useful methods, concepts and measurement techniques which have been developed.¹⁴ It will be a long time before perceptual models are capable of simulating a real situation, and, in the interval, quantifying approaches will demand a reduction of complexity to simple parameters, often substituting constants for portions of the environment in the relationships being measured.¹⁵

A choice must be made between roughly outlining the significant factors in real human decisions with the hope of developing theory later, and the alternative of measuring more precisely only limited

and isolated aspects in artificial environments in order to gradually construct a more rigorous methodology and theory which can then be applied to the real world.¹⁶ The greater portion of studies completed to date have opted for the former approach. The study at hand is more inclined toward the latter, involving a projective technique which simplifies and standardizes the stimulus object. It is also designed with the potential to expand the methodological bounds of perception studies by applying this particular measurement technique in a relatively novel manner.

PROFESSIONAL AND INSTITUTIONAL EFFECTS ON PERCEPTION IN RESOURCES MANAGEMENT

Rather than attempt a classification of all geographically useful research in perception - a feat which has been accomplished quite adeptly by a number of authors¹⁷ - the intention here is simply to provide an indication of the scope of such work as has directly involved resource managers. For these purposes it seems appropriate to deal successively with studies which involve, 1) differences in attitudes between government officials and the public; 2) differences in attitudes between levels of government; 3) differences in attitude by institutional affiliation; and, 4) differences in attitude by professional affiliations. The author intends no pretense that the review that follows is exhaustive; merely that it refers to a number of the more important contributions in each category.

Differences In Attitudes Between Government Officials and The Public

Research along these lines probably comprises the greatest

contribution of the four categories listed as well as having provided much of the original justification of the need for perception studies to facilitate proper resource management.

Perhaps the classic revelation of such perceptual differences is Fonaroff's study of the several attempts made in the 1930's by the U.S. Indian Service to rationalize the economy of the Navajo Indians.¹⁸ Fonaroff felt that the consistent failure of these projects derived primarily from the agency's attempt to impose a system of resource management on a group of people who saw the facts in a different light, reacted to them in a different manner, sometimes failed to perceive them at all. Although this example does represent a rather extreme case in that two vastly different cultural groups were involved, later investigators have found little difficulty in isolating such instances in situations of relative cultural homogeneity as well.

Quinney has documented the similar failure of U.S. forest resource policy with regard to small private woodlands.¹⁹ Several decades of increasing concern over the ability of domestic timber suppliers to meet the demands of future generations culminated in a concerted attempt to increase the efficiency of wood production on these holdings. Programs designed towards this end proceeded on the assumption that these private owners were possessors of an economic resource only (that is, land and timber), and that economic obstacles alone were preventing him from raising the level of productivity on his forested lands. The government failed to recognize the change in perceived value of these lands strongly towards psychic appreciation and other recreational values, thus dooming their policy.

Probably the most prolific field of study in perception research is that of natural hazards.²⁰ Associated research has uncovered considerable divergence between the perception of natural hazards of technical-scientific personnel and that of resource users (particularly in the case of floods). Resource users have generally been found either unwilling or unable to adopt a probabilistic view of the world and not able to live with uncertainty in such a manner as to extract full value from partial knowledge.²¹ Commonly encountered responses to these uncertainties included eliminating the hazard by either denying or downgrading its existence or recurrence, and eliminating the uncertainty by either making the hazard knowable and determineable or trusting in God or the government to resolve the problem.²²

These types of attitudes generally lead to weighing uncertain costs more lightly than is advisable in light of the scientific facts. An excellent example is that of Fairfield, Connecticut, where some users of the waterfront opposed the construction of a protective dike along the shore on the grounds it would interfere with their view and result in loss of breeze.²³ Factors mentioned by Burton and Kates as contributing towards these types of situations include the actual divergences of opinion between professionals, varying views as to man's relation to nature, and the fact that short-term occupancy of hazard areas by individuals make long-term hazard frequencies seem irrelevant.

In the Canadian context, Mitchell²⁴ and Burton have both cited examples of divergences between the resource manager and the public. Mitchell, by sampling in the Kitchener area, revealed that

whereas a large portion of the public (71%) perceived pollution to be the major water management problem in the area, only thirty-nine percent of the relevant professionals interviewed were in agreement. Similarly, while more than half the professionals (55%) considered water supply the most pressing problem, only twenty-five percent of the public were in agreement. Burton²⁵ has indicated how the potential repercussions of adverse public opinion can bear on the fate of large-scale resource management schemes. He cites the Churchill-Nelson Diversion scheme and the aborted Spadina Expressway as cases which exemplify the waste which can result from failing to explore public feelings and attitudes at an early stage, and also possibly from failing to reconcile these public viewpoints with professional ones.

Prior to leaving this aspect of the perceptions of resource managers it seems appropriate to mention Borton and Warner's²⁶ account of the communication-participation experiment in the Susquehanna River Basin. The study, conducted in association with comprehensive water management plans was an attempt to effect an efficient two-way communication between technical planners and the public during the water resources planning process. The success of the experiment, which was focused upon opinion-leaders with a lesser emphasis on public forums, is indicated in the degree of convergence produced in perceived management priorities between the planners and local respondents.²⁷

Differences In Attitude By Level of Government

Downey²⁸ has made an interesting observation concerning the emphasis of water management policies in the United States. As long as the reins of public policy remained in the hands of local government,

primary goals centred on the protection of human health and the insurance of a potable domestic water supply. Current legislation, by comparison, is instigated primarily from the federal level and is now based on aesthetic, ethical and recreational criteria. The result is that pollution abatement is no longer prompted purely on the basis of severe and persistent nuisance conditions,²⁹ and localities such as those bordering the Merrimac River in Massachussetts are obliged to support a program of pollution abatement despite their low level of concern for the problem.³⁰

Kasperson³¹ discovered evidence of perceptual variations between levels of government in his treatment of the Brockton water crisis. Under circumstances of insufficient supply and political complications with regard to its supplementation, Brockton officials indicated their willingness to consider multiple water uses, while the State Public Health Department remained intransigent to recreational use of municipal supply reservoirs.³² Also, while the state government was obliged to consider the interests of Silver Lake residents from whose locale the proposed water diversion was to take place, Brockton's evaluation of costs and benefits related only to the area and population within the political limits of the town.³³

In the Canadian context, O'Riordan has illustrated how the decisions of two municipal governments with overlapping constituencies were affected by their desire to avoid their urgently required amalgamation. Salmon Arm Village and Salmon Arm District developed entirely different answers to the disposal of sewage wastes in response to the same pollution problem. They justified their respective solutions on

the basis of differing perception of the threat involved. Guymer's study³⁵ of the decision-making process which culminated in the extension of London's water supply, also illustrates the variation in perspective between municipally-based bodies (the Municipal Council and the Public Utilities Commission) and those of provincial orientation. While municipal agencies (with their areally constricted experience and jurisdiction) were divided as to the ideal solution to impending water shortages, provincial authorities (with a vested interest in establishing a regional network of water supply and jurisdiction over the entire southern part of the province) consistently backed a pipeline from either Lake Erie or Huron.

Institutional Effects On Attitudes

The sociological and psychological literature is replete with investigations of the relationship between occupations and attitudes, but the overwhelming portion seems to be oriented toward occupational placement. Rosenberg does, however, briefly consider the impact of occupational choices on values.³⁶ He reasserts Merton's³⁷ theory of "anticipatory socialization" whereby people start to think and behave in a manner which they feel will be appropriate in the occupation they aspire to undertaking. However, he continues to hypothesize that people also tend to adopt the values of their occupation even though it may not have been their original choice. Not only are values and occupational choices mutually influential, but they also tend to change in the direction of greater mutual consistency, thereby leading to reduction of conflict. This theory received specific

application in Lieberman's comparison of working men's attitudes prior and subsequent to promotion.³⁸ Results of the study revealed a clear relation between upward mobility and greater association with management objectives.

A number of other social scientists have also suggested that role conceptions are affected by experience, position in the employment hierarchy, and the degree of identification with the work group.³⁹ Marshall⁴⁰ reported a powerful personal identification of employees with the established goals and strategies of resource management agencies, in company with a resistance to innovation and proposals that depart drastically from accepted practice.

Among geographers, O'Riordan's study of Salmon Arm decision-making revealed a high level of group solidarity within the two municipal councils involved.⁴¹ The author relates this solidarity to the desire of the councils to present a united front in the face of external criticism, the fear of standing out alone in the face of an otherwise unanimous consensus, and the influence of dominant personalities in the hierarchy of the group. Burton cites the constricted goals of the agency responsible for initiating the Churchill-Nelson diversion (i.e., Manitoba Hydro) as the cause of the original, constricted perception of costs and benefits worthy of consideration.⁴² With respect to the water supply question in London, Guymer concludes that the institutional arrangements for water resources management had a direct effect on the alternatives considered, the manner of their consideration and the eventual outcome.⁴³

Perhaps the most comprehensive exploration of institutional effects on decision-making in resource management is that by MacIver

of water supply alternatives in the Grand River basin.⁴⁴ In accumulating the preferred alternatives of a number of personnel responsible for extending urban water supply in the region he found a remarkable coherence within groups complemented by wide discrepancies between them. Agency experience with two of the potential sources (in a day-to-day professional capacity) was directly associated with over half of the variation, while ten of the eleven other choices followed institutionally homogeneous patterns. The author explains the latter correlation to be the result of the manner in which institutional goals and criteria channel patterns of thought toward institutionally identical conclusions.⁴⁵ These findings led the author to recommend that all aspects of a resource decision - the traditions of the agency making it, the criteria and the goals of all interested bodies, the manner in which past experiences can affect choice - should be relevant fields of study in addition to the review of all relevant alternatives.⁴⁶

The Effect of Professional Affiliations on Attitudes

One of the most important characteristics of contemporary resource management is the dominant influence of people who feel strong professional identification. They not only inherit customary ways of defining significant parts of the environment, but also are disposed to distort or ignore phenomena that they regard as beyond their responsibility or competence.⁴⁷ Professionals have progressively assumed not only the responsibility for solving problems and recommending means, but also for defining the goals themselves.⁴⁸ Agencies and departments historically have been staffed with one kind of professional, which further encourages the symptoms of "tunnel vision"; that is, the

monopolization of a small group of procedures by each agency to the exclusion of other modes of thought.⁴⁹ Marshall⁵⁰ has observed that professionals are bound by a mutual respect and code of ethics that tends to make them somewhat less informed of and less responsive to external criticism than would be the case if these strong bonds were not felt. This creates a powerful, partly insulated attitudinal environment which encourages conformity to accepted codes of behaviour and established problem-solving techniques.⁵¹ The search to explain the effects that these factors have caused on resource management decisions thus becomes a legitimate cause for research.

Engineers have probably received the most attention of all professional groups engaged in resources management.⁵² The criticisms which have arisen from these studies revolved mainly around the engineers' constricted perception of management alternatives. Solutions involving construction have dominated their thinking to an extraordinary degree with other alternatives such as improving the efficiency of use, sharpening the liaison between potentially conflicting programs, or simplifying the complicated legal and institutional tangles, being rarely perceived, much less implemented.⁵³

Public health officials are another group which has received attention. Hewings,⁵⁴ in his study of the attitudes of Ontario Public Health Officials responsible for placarding public beaches found little awareness of the doubts expressed by others concerning the reliability of their pollution criteria. Neither did they display much knowledge as to the questionability of applying drinking standards to recreation, tending, instead to base their decisions upon the assumption that if these standards were not met that there was, in fact, a problem to be dealt with.

McMeiken, in a more comprehensive study of public health officials in British Columbia,⁵⁵ found variation in attitudes concerning water quality management to be principally associated with years in the profession, rank and mobility, institutional affiliations and views as to man's relationship with nature.

In a more recent article, Sewell⁵⁶ compared the McMeiken findings with some of his own on water management engineers.⁵⁷ His comparison indicated that although public health officials considered environmental quality problems of the utmost importance, engineers felt that a number of social problems were of greater concern. Whereas public health officials viewed water quality as a health problem, engineers tended to see it more in terms of increased costs to production. Perception of solutions also followed professional lines; health officials leaning toward punitive legislation while engineers preferred provision of additional water to increase the assimilative capacity of the water body, or installation of effluent processing facilities. Both groups believed they were highly qualified to do their respective jobs and that they acted in the public interest. Contact with other agencies or the general public, however, was considered either unnecessary due to the completeness of their own activities, or potentially harmful because it complicates planning and tends to delay or even stop the implementation of solutions.⁵⁸

Analysis showed that those who had been in the profession the longest and ranked the highest were least anxious to promote change in the agency's policies, focus of attention and structure.⁵⁹ Also, those who shared the opinion that man was in control of nature, also believed that outside consultation was unnecessary, or detri-

mental, that the then current water quality criteria were valid, and that water purification problems were not a matter for great concern.⁶⁰

Although the results of these studies show considerable promise for facilitating greater efficiencies in resource management, very little attempt has been made to extend research to other professional groups such as Foresters, Biologists, Agriculturalists and Geographers. This perhaps is due to the logical expectation that these groups would be less homogeneous because they are somewhat more oriented towards furthering knowledge (as opposed to developing a common set of goals and beliefs) than the more traditional professions.⁶¹

Foresters have, however, been the subject of two relevant studies. Brody in 1957 examined the basic interest patterns of professional Foresters in a number of different occupation types.⁶² Results of the survey revealed that Foresters tend to have markedly more outdoor interests and less desire for situations requiring personal influence and office work requiring great attention to detail than do men in general.⁶³

Hendee and Harris⁶⁴ investigated the degree of similarity between wilderness user attitudes and the way they were perceived by Foresters who managed wilderness. Foresters were found to closely resemble users in the pureness of their perspective of wilderness, and correctly perceived users' reactions to two-thirds of suggested wilderness management policies and behaviour norms. However, they overestimated public support both for development and for purist philosophies regarding resource management practices. They also viewed users as less responsive to suggested behaviour controls and more clearly opinionated than was actually the case (in the verbal sense at least).

The authors attribute these misperceptions to limited exposure to typical users as opposed to excessive contact with organized conservationists and user groups, and "selective perception" based on the differences between managers and users. They stress the need for the Forester to recognize the difference between their perception of wilderness as a work environment which they take for granted and that of the user who regards it as a unique, recreational setting.

STUDY ORIENTATION

The present study is designed to satisfy two major goals: firstly, to contribute to the laying of a theoretical foundation for geographical studies of perception; and, secondly, to expand the methodological bounds of the study of environmental perception. The author attempts to compare the effects of professional, institutional and biographical factors on the attitudes of public forest land managers in Alberta. Unlike previous related research a significant number of professional and institutional groups are represented within the same sample. It also differs in that these institutional groups are closely associated in organizational structure and interaction and that they exhibit varying degrees of domination by particular professions. It is an attempt to discover not only which factors contribute most to variation in perception of problems, solutions and terms, but also the types of response tendencies which characterize those groups with recognizeable patterns of response (should such exist). It is the author's hope that the results of the study will be applied towards a better understanding of regional and other differences in the perception of real world situations. They should aid towards this end

in indicating and explaining variables (professional, institutional and biographical) which are operative regardless of variations in stimulus so that the more complex variations which occur when relationships with the real environment are concerned can be more easily identified and measured. The results should also contribute to a higher degree of mutual understanding among professional groups responsible for managing the forested land resource.

The methodological orientation is unique primarily in that the stimulus material is standardized and projected by means of cartoons. A more complete appraisal of methodological orientation is presented in Chapter Four.

REFERENCES AND FOOTNOTES

- 1 H.H. Barrows, "Geography As Human Ecology", Annals, Assoc. of American Geographers (1923), Vol. 13, pp. 1-14.
- 2 R.B. MacLeod, "The Phenomenological Approach to Social Psychology", Psychological Review (1947), Vol. 54, pp. 193-210.
- 3 J.K. Wright, "Terrae Incognitae: The Place of Imagination In Geography", Annals, Assoc. of American Geographers (1947), Vol. 37, pp. 1-15.
- 4 Ibid., p. 12.
- 5 W. Kirk, "Historical Geography and the Concept of the Behavioural Environment", Indian Geographical Journal (1951), pp. 152-160; "Problems in Geography", Geography (1963), Vol. 48, pp. 357-371.
- 6 W. Kirk, "Historical Geography and the Concept of the Behavioural Environment", op. cit., p. 160.
- 7 H.C. Brookfield, "On the Environment As Perceived", pp. 51-80, in Progress In Geography, by C. Board et. al. (eds.), Vol. 1, Edward Arnold, London, 1969.
- 8 David Lowenthal, "Geography, Experience and Imagination: Towards A Geographical Epistemology", Annals, Assoc. of American Geographers (1961), Vol. 51, p. 260.
- 9 Ibid., p. 245.
- 10 Ibid., p. 260.
- 11 Roger M. Downs, "Geographic Space Perception: Past Approaches and Future Prospects", pp. 65-103 in Progress In Geography, Vol. 2 by Christopher Board, et. al. (eds.), Edward Arnold, London, 1967, p. 68.
- 12 H.C. Brookfield, op. cit., p. 75.
- 13 L.J. Wood, "Perception Studies In Geography", Trans. I. B. G. No. 50, pp. 129-142, 1970, p. 136.
- 14 T.F. Saarinen, Perception of Environment, AAG Commission on College Geography, Resource Paper No. 5, 37 p., 1969, p. 4.
- 15 H.C. Brookfield, op. cit., p. 74.
- 16 T.F. Saarinen, op. cit., p. 3. Not to imply that application of a theoretical base to the real world is not a challenging task in itself.

- 17 See for example: M.J. Bowen, R.W. Kates, and D. Lowenthal, Bibliography On Environmental Perception (in preparation); C. Clayton, "Human Perception of the Rural and Urban Environments", Unpublished Master's Thesis, University of Cincinnati, 1968; Roger M. Downs, op. cit.; B.R. Boodey, "Environmental Extra - Environmental and Preferential Perception in Geography", Unpublished paper, Department of Geography, University of North Dakota, Grand Forks, 1968; T.F. Saarinen, op. cit.; L.J. Wood, op. cit.
- 18 L.S. Fonaroff, "Conservation and Stock Reduction on the Navajo Tribal Range", Geographical Review (1963), Vol. 53, pp. 200-223.
- 19 D.N. Quinney, "Small Private Land Ownership In The U.S. - Individual and Social Perception", Natural Resources Journal (1964), pp. 379-393.
- 20 For an effective summary, see: Ian Burton and R.W. Kates, "Perception of Natural Hazards in Resource Management", Natural Resources Journal (1964), Vol. 3, pp. 412-441.
- 21 Ibid., p. 433.
- 22 Ibid., p. 435.
- 23 Ibid., p. 430.
- 24 B. Mitchell, "Behavioural Aspects of Water Management: A Paradigm and A Case Study", Environment and Behaviour (1971), Vol. 3, pp. 135-154.
- 25 Ian Burton, "The Social Role of Attitude and Perception Studies", pp. 1-6, in W.R.D. Sewell and Ian Burton (eds.) Perceptions and Attitudes in Resource Management, Information Canada, Ottawa, 1971.
- 26 T.E. Borton, and K.P. Warner, "Involving Citizens In Water Resources Planning: The Communication - Participation Experiment In The Susquehanna River Basin", Environment and Behaviour (1971), Vol. 3, pp. 284-306.
- 27 Ibid., p. 296-297.
- 28 George T. Downey, "Alternative Choices In Water Pollution Control", Proceedings of the AAG, Washington, 1968, 13 p.
- 29 Ibid., pp. 6-7.
- 30 Ibid., pp. 9-10.

- 31 R.E. Kasperson, "Political Behaviour and The Decision-Making Process In The Allocation of Water Resources Between Recreational and Municipal Use", Natural Resources Journal (1969), Vol. 9, pp. 176-211.
- 32 Ibid., p. 189. Baumann has further investigated regional variations in the perceived acceptability of recreational use of urban domestic water supply reservoirs. See D.D. Baumann, The Recreational Use of Domestic Water Supply Reservoirs: Perception and Choice, University of Chicago Press, Dept. of Geography Research Paper No. 121, 1969.
- 33 Ibid., p. 206.
- 34 Timothy O'Riordan, "Towards A Strategy of Public Involvement", pp. 99-110 in W.R.D. Sewell and Ian Burton (eds.), Perceptions and Attitudes In Resource Management, Information Canada, Ottawa 1971; "Public Opinion and Environmental Quality: A Reappraisal", Environment and Behaviour (1971), Vol. 3, pp. 191-214.
- 35 Andrew Guymer, "Water Supply For London, Ontario", pp. 61-70, in W.R.D. Sewell and Ian Eurtion (eds.) Perception and Attitudes In Resource Mangement, Information Canada, Ottawa, 1971.
- 36 Morris Rosenberg. Occupations and Values, The Free Press, Glencoe, Illinois, 1957, pp. 23-24.
- 37 Robert Morton, Social Theory and Social Structure, Glencoe, Free Press, New York, 1957.
- 38 S. Lieberman, "The Effects of Changes In Roles On The Attitudes Of Role Occupants", pp. 460-474 in Donald G. Zytowski (ed.) Vocational Behaviour: Readings In Theory and Research, Hold, Rinehart and Winston Inc., Toronto, 1968.
- 39 See for instance: Robert L. Kahn, Organizational Stress: Studies In Role Conflict and Ambiguity, John Wiley and Sons, New York, 1964; Robert Presthus, Men At The Top: A Study In Community Power, Oxford University Press, New York, 1964; Herbert A Simon, Administrative Behaviour: A Study In Decision-Making Processes In Administrative Organization, Glencoe Free Press, New York, 1957; A.P. Pross, "The Development of Professions In The Public Service; Foresters In Ontario", Canadian Public Administration Journal (1967), Vol. 10, pp. 376-404.
- 40 H. Marshall, "Rational Choice In Water Resources Planning", pp. 403-423 in S.C. Smith and E.N. Castel, Economics and Public Policy In Water Resource Development, Iowa State University Press, Ames, Iowa, 1965, "Politics and Efficiency In Water Development", pp. 291-310 in A.V. Kneese and S.C. Smith (eds.) Water Research, John Hopkins University Press, Baltimore, 1966.
- 41 Timothy O'Riordan, "Towards A Strategy of Public Involvement", op. cit., p. 108.

- 42 Ian Burton, op. cit., pp. 1-2.
- 43 Andrew Guymer, op. cit., p. 69.
- 44 Ian MacIver, Urban Water Supply Alternatives: Perception and Choice In the Grand River Basin, Ontario, University of Chicago, Department of Geography Research Paper No. 126, Chicago, 1970.
- 45 Ian MacIver, "Municipal Water Supply In The Grand River Basin Region", pp. 49-60 in W.R.D. Sewell and Ian Burton (eds.) Perception and Attitudes In Resource Management, Information Canada, Ottawa, 1971, p. 56.
- 46 Ibid., p. 59.
- 47 Gilbert F. White, "Formation and Role of Public Attitudes", pp. 105-127 in H. Jarrett (ed.) Environmental Quality in a Growing Economy, John Hopkins Press, Baltimore, 1966, p. 125.
- 48 W.R.D. Sewell, "Environmental Perceptions and Attitudes of Engineers and Public Health Officials", Environment and Behaviour (1970), Vol. 3, p. 24. Recent legislation has to some extent arrested or even reversed this trend through recent reassertion of the public and parliamentary role in goal setting.
- 49 Ian MacIver, Urban Water Supply Alternatives: Perception and Choice In The Grand River Basin, Ontario, op. cit., p. 25.
- 50 H. Marshall, "Politics and Efficiency In Water Development", pp. 291-310 in A.V. Kneese and S.C. Smith (eds.) Water Research, John Hopkins University Press, Baltimore, 1966.
- 51 Timothy O'Riordan, Perspectives On Resource Management, Pion Limited, London, 1971, p. 107.
- 52 See for instance: Louis B. Barnes. Organizational Systems and Engineering Groups, Harvard University Press, Boston, 1960; Hardy Cross, Engineers and Ivory Towers, McGraw-Hill, New York, 1952; J.E. Gersth and S.P. Hutton. Engineers: The Anatomy Of A Profession, Tavistock, London, 1966; J.D. Kemper, The Engineer and His Profession, Holt, Rinehard and Winston, New York, 1967; Arthur A. Maass; Muddy Waters: The Army Engineers and The Nation's Rivers, Harvard University Press, Cambridge, Mass., 1951.
- 53 O'Riordan, op. cit., pp. 105-106.
- 54 John M. Hewings, "Water Quality and the Hazard To Health: Placarding Public Beaches", Natural Hazard Research Paper No. 3, 1966.

- 55 J.E. McMeiken, "Public Health Officials and The Environment: A Study of Perceptions and Attitudes", Unpublished Master's Thesis, University of Victoria, 1970.
- 56 W.R.D. Sewell, op. cit.
- 57 W.R.D. Sewell, "The Role of Attitudes of Engineers In Water Management", in F.L. Strodbeck and G.F. White (eds.) Attitudes Toward Water: An Interdisciplinary Exploration, (Unpublished Manuscript), University of Chicago Press, Chicago.
- 58 W.R.D. Sewell, "Environmental Perception and Attitudes of Engineers and Public Health Officials", op. cit., p. 40.
- 59 Ibid., pp. 43-44.
- 60 Ibid., p. 55.
- 61 Kenneth Prandy, Professional Employees, Faber and Faber Limited, London, 1965, pp. 175-177.
- 62 D.S. Brody, "Kuder Interest Patterns of Professional Forest Service Men", Educational and Psych. Measurement (1957), Vol. 17, pp. 599-605.
- 63 Ibid., p. 601.
- 64 J.C. Hendee and R.W. Harris, "Foresters' Perception of Wilderness - User Attitudes and Preferences", Journal of Forestry (1970), Vol. 68, pp. 759-762.

CHAPTER IV

METHODOLOGY

SAMPLE

A three-part questionnaire was administered in the months of June, July, August and September 1972 to selected Alberta Civil Servants who were involved with the management of forested lands in the province. The sample group comprised a total of seventy-two respondents.

This group was chosen in particular for a number of reasons. Alberta was deemed a suitable location from which to select respondents due to the multiplicity of land uses which are demanded of its forested areas. Provincial Civil Servants were chosen because of their day-to-day involvement in the management of forested lands for a multitude of uses; private managers in general being far less concerned with alternate and multiple uses. Public resource managers are subject to a great many public and private demands as well as being held responsible for decision-making concerning them to a considerably greater degree. More obvious reasons are the large proportion of Alberta's forested lands which remain in Crown Title (97.9%), the fact that public resource managers are the only group capable of instituting province-wide and comprehensive policies, and the handiness of Alberta Civil Servants in particular.

The agencies sampled within the Provincial Administration were selected on the basis of degree of involvement with forested land management. The bulk of agencies whose predominant concern was with forested areas (Timber Management Branch, Forest Land Use Branch, Fish and Wildlife Division, Multiple Land Use Section, all in the Department

of Lands and Forests)¹ were represented in addition to a significant number of agencies whose concern was either partially or marginally so (Water Resources Division, Environment Conservation Authority, and Interdepartmental Planning Division, all in the Department of the Environment, Lands Division, and Parks Division, both in the Department of Lands and Forests, Provincial Planning Branch of the Department of Municipal Affairs, and the Strip Coal Advisory Committee, an advisory group responsible for outlining strip coal reserves). One interdisciplinary committee (Land Use Assignment Committee) was also sampled in the hopes that the views of its members would reveal the effect (if any) of such an affiliation on the attitudes and opinions to be measured.

Individuals sampled were chosen from the uppermost ranks of authority with a conscious attempt to include those for whom the questionnaire was most relevant; resource managers as opposed to technicians. Sample content is deficient chiefly in its exclusion of representation from the Department of Mines and Minerals (from which the author failed to secure a useful number (five) of complete returns) and from any agency specifically responsible for recreational development (this being largely impossible due to the current dispersion of responsibilities relating thereto). Sample content was also biased in one instance by the need to secure respondents for whom the bulk of the questionnaire was meaningful. In this case (Water Resources Division)² it must be recognized that the conclusions drawn using this sample may not be a reflection of opinions of the sampled group as a whole.

HYPOTHESES

The primary hypothesis tested was as follows:

The ways in which public forest resource managers, planners and advisors perceive forest management problems and their solutions (if they do at all) is a reflection of professional, vocational (agency affiliation) and biographical factors (specifically age and participation in outdoor recreation).

It had originally been intended that additional biographical factors be taken into consideration but time and data quality constraints made this impossible.

A number of subordinate and ancillary hypotheses were also examined:

1. attitudinal similarities are greater with vocational than with professional groups.
2. group perceptions are most pronounced when a particular type of professional dominates an institutional group.
3. criteria for the resolution of forest management problems are either poorly defined or inconsistent and the terms "multiple use" and "use conflict" have no generally accepted meanings.
4. perceived importance of forest management problems varies directly as the degree of involvement of the respondent's agency with such matters.
5. forest resource managers' appraisal of the degree of opinion-

conformity within the agencies with which they are employed will bear no meaningful correlation with sampled levels of conformity.

QUESTIONNAIRE

A three-part questionnaire was constructed to test the aforementioned hypotheses. Sections A and C of the questionnaire conformed largely to standard interview and questionnaire design employing a variety of questioning techniques based on both open-ended and forced choice responses. Section A (Appendix A) was administered in an interview format allowing interaction between respondent and interviewer. In it information was requested regarding the perceived importance of forest management problems, the definition and source of awareness of forest land use conflicts and personally preferred criteria for the resolution of forest management problems. Respondents were also requested to define and evaluate the concept of multiple use, as well as the degree of success encountered in its application in Alberta, to outline the major cause of difficulties in present day efforts to manage the forest for many products, and to estimate the degree of attitudinal conformity within their agency. Section A also included a number of other questions designed simply to familiarize the author with internal dynamics of the provincial administrative system.

Section C, the mailing questionnaire (Appendix C), was designed for the gathering of exclusively biographical data. Questions therein related to age, education, occupational history, organizational affiliations, reading habits and leisure time activities.

Respondents were also requested to specify the main reason for having embarked upon their present career and what knowledge or experience they found particularly valuable in their work.

Section B of the questionnaire (Appendix B) was a modified version of the Rosenzweig Picture Frustration (P-F) Test.³ The test form consisted of twenty-four cartoons depicting stimulus situations of a frustrating nature. Each cartoon portrays two people with caption boxes, one box containing a description of the source of frustration and the other left blank for the subject's response. To facilitate respondent identification with the human figure in the cartoon, the facial features and other expressions of personality are purposely omitted. All cartoons are designed to depict the locale of the frustrating situation, and the respondent is asked to reply to the instigating party as though he were the other person in the cartoon. The subject is advised simply to assume the role of himself in his working environment, responding to the stimulus as he normally would under such circumstances. The stimulus situation was presented as being hypothetical without necessarily having any application in Alberta. Respondents were asked if the cartoon appraisal of the situation was one he agreed with and why.

The cartoons were intended to provide a variety of frustrating resource management situations involving conflicting users and/or uses of forested lands. They included at least one example of the following types of potential resource management conflict:

1. watershed values vs. timber
2. timber vs. recreation
3. strip mining vs. aesthetics

4. timber vs. domestic grazing
5. access roads vs. other uses and values
6. domestic grazing vs. watershed values
7. timber vs. fish and wildlife
8. timber vs. aesthetics
9. transport and communication vs. other uses
10. strip mining vs. aquatic life and water quality
11. access roads/recreation vs. wildlife

Cartoon sequence was arranged in such an order as to minimize item interaction.

Coding of cartoon responses was based largely on Rosenzweig's original format with some notable alterations. (See summary of coding format in Appendix B.) The major breakdown remained in accordance with the type of reaction and the direction of aggression (i.e., blame for the obstacle or problem portrayed, and responsibility for initiating a solution to the problem). Reactions were always coded as to type of reaction but direction of aggression was not always specified by the respondent. Major reaction types included obstacle dominance (OD - indicating resignation to the problem) and needs persistence (NP - indicating a stress on solution of the problem. Both of which were native to Rosenzweig's original classification), as well as obstacle negation (ON - an improvised category formerly split as subtypes of the other two categories indicates denial or denigration of the problem). Rosenzweig's third category of ego-defensive⁴ was excluded on the grounds that it would serve little use with cartoons which did not present a stimulus which directly affected the respondent.⁵ The original classifications according to direction of

aggression (Intropunitive, Extrapunitive, Impunitive) were further divided according to whether they referred to responsibility for the conflict/obstacle or responsibility for its solution. One further adjustment entailed the classification of solutions in the event that they were proffered. Solutions were categorized in accordance with whether they stressed either user/use conciliation, holding an offending party responsible for damages, penalizing the offending party, or excluding him altogether from the use of the land. All subtypes of major categories were arrived at in response to the returns.

Further modifications were made in Rosenzweig's recommended technique of administration. Considerably less stress was placed on the need to respond quickly and instinctively, it being reasoned that the more complex stimuli involved warranted some degree of thought if meaningful and representative answers were to be obtained. The suggested policy of requiring the respondent to read aloud his reactions was briefly employed in the pilot survey and subsequently discarded. The author felt that supplementary questioning and attention to peculiarities of inflection would be insufficiently rewarding to warrant the added interviewer-respondent interaction which would be involved. Also considered were the facts that inflections would prove of little additional value in the absence of ego-defensive answers, and the discomfort this practice tended to afford the respondent.

The author opted instead for the alternative approach of restricting supplementary questioning (with its undesirable interactional variations) as much as possible while making whatever interaction proved unavoidable, as standardized as possible. Apart from the initial orientation procedures, discussion of the stimulus

material was limited to a brief examination of the response style on the first cartoon.

As many respondents as possible were interviewed in their work setting (95.8%), in an attempt to encourage answers at a response level as near as possible to that of their work situation. Participants generally completed the first two sections of the questionnaire during the interview, leaving the remaining section for subsequent completion and return. When time constrictions so demanded, the second section as well was left with the respondent. However, this occurred in only a few cases and incurred no diminution of data value as a result. The interview generally varied in duration from forty-five minutes to an hour and forty-five minutes. The final return rate for complete questionnaires was 87.5%.

A pilot study was completed with ten individuals within the sample population prior to proceeding with the major portion of interviews. Required adjustments necessitated as a result of this study were sufficiently inconsequential (involving mainly the elimination of certain questions) that the author decided not to exclude the affected respondents from the major analysis.

The interview preamble included an identification of the study objectives with an attempt to relate them in a positive way to the respondent, and an indication of the study sponsor. The respondent was informed of the means by which he had been chosen and assurances were given of both confidence and anonymity. It was consistently made clear that what was being requested was not a statement of policy but rather the respondent's personal opinion as a professional.

DATA ANALYSIS

For purposes of analyzing the accumulated data, the author felt that tabulation and cross-tabulation of proportions was all that the study could warrant. It was felt that any further form of statistical analysis would only pretend a level of measurement precision which was never achieved. A number of reasons can be stated in support of this decision:

1. the size of sample groupings generally ranges from three to thirteen for the most important sections of the analysis.
2. the coding system of the picture-frustration test has a sufficient number of components that it further reduces the statistical significance of any intergroup analysis.
3. the high degree of bias and subjectivity which any attitude measuring instrument is bound to introduce either due to the respondent, the interviewer or the interaction between the two.
4. the fact that the measurement instrument which is central to the entire research (the P-F Test), is in its experimental stages for the purpose it is required to serve.

For purposes of analysis, the number of P-F cartoons to be used was reduced from twenty-four to twelve. The cartoons employed had encountered widely varying degrees of success and the author felt that exclusion of the less reliable ones would contribute significantly towards the exclusion of uncontrolled biases. The primary criterion for item exclusion was ambiguity; where, for a variety of reasons, the stimulus object was interpreted with considerable differences

from one respondent to another. Other associated problems considered sufficiently disturbing to results to warrant exclusion included 1) stimuli with a sufficiently excessive number of components as to discourage or make difficult a response to all of them; 2) cartoons with portrayed situations at variance with provincial legislation;⁶ 3) cartoons which presented situations which were frequently branded as being of little local importance; 4) cartoons for which the stimulus entailed such implications as to restrict a full range of possible answers;⁷ and, 5) cartoons which tended to duplicate others in either perceived stimulus or distribution of response types.

In order to quantify the homogeneity of response within particular professional and vocational groups the measure adopted was the average of conformity ratings for each cartoon. The rating was the percentage of all responses relating to type of reaction, which fell within the most highly represented major category (i.e., OD, ON, NP). Admittedly, this is a somewhat crude measure. Unfortunately, however, the more preferable alternative of measuring frequency of response aggregates (instead of response components) would be meaningless with such small sample groups.

The nature of the coding system forbids a similar comparison by reaction subtypes⁸ (e.g., number of subtypes required to comprise a given percentage of the total number of response components) due to varying degrees of complexity in the answers. The author does feel, however, that the adopted measure is sufficiently representative to serve the necessary purpose. Not only does the type of reaction comprise the major component of the coding but its categories are also in large part mutually exclusive, and is present in all responses.⁹

The index of outdoor recreation activity which is employed in correlation with response tendencies for cartoons involving recreational use, was devised on the basis of the indicated preference for such activity relative to other leisure-time pursuits.

METHODOLOGICAL APPRAISAL

Mailing and Interview Questionnaires

Some mention should be made of the constraints and weaknesses associated with the chosen methodologies.

Mailed questionnaires generally tend to suffer from problems relating to the lack of opportunity for question clarification, poor return rates and a lack of control over response procedures. However, these problems - as is evidenced in the returns - did not manifest themselves to any noticeable degree in Section C of the questionnaire. An acceptable rate of return was assured by previous collaboration on the first two (more time-consuming sections) and the simplistic, and respondent-specific nature of the information requested (biographical factors which were either familiar or else requested in a multiple-choice form).

Sources of bias potentially attributable to an interview format are far more numerous as a result of interaction between interviewer and respondent. Webb and others have listed at least nine different types of bias native to interviews and questionnaires.¹⁰ Sources of error from the respondent could include the guinea pig effect, role selection, measurement as an agent of change and response sets.

The probability of bias is high in any study in which the respondent is aware of his subject status (i.e., feels he is a guinea pig). The natural wish is to make a favorable impression by providing socially-desirable responses. Also, the roles of subject and experimenter are well understood within our culture, and carry with them well-defined mutual role expectations. Any adherence to these pre-conceived requirements removes the respondent from his native role which the survey intends to tap. A role playing choice is most likely when the subject matter is novel or unexpected. The level of response being sampled will seriously affect the nature of the answers acquired. The distinction between encouraging respondents to assume the role of expert or layman often has a severe effect on questions the subject is only marginally equipped to answer. Of considerable effect in assuring since answers is a guarantee of confidentiality and anonymity.

The subject's performance in an experiment has also been conceptualized as problem solving behaviour; that is, at some level he sees it as his task to ascertain the true purpose of the experiment and to respond in a manner which will support the hypothesis being tested. Thus, if the purpose of the experiment is ambiguous, many different hypotheses may be formed by different subjects leading to inconclusive results. If, on the other hand, the intentions of the researcher are obvious, there is a tendency to lean over backwards to be honest, actually creating a bias which discriminates against the hypothesis.¹¹

The measurement process itself may function to suggest responses or stimulate an interest in the subject not previously felt. Item preamble is generally absorbed and accepted regardless of its

content; it creates attitudes that persist and are measurable on subsequent questions for which a preamble is not provided. Topical imbalance represents a threat to the clear thinking of respondents. Dichotomous questions and multiple choice queries which leave out significant alternatives tend to encourage comparable thought patterns and discourage answers which diverge from the researcher's expectations.¹² The "no opinion" alternative may be partially avoided because it connotes weakness and ignorance, or perhaps preferred, if the set of alternatives offered is inadequate.¹³

Response sets, or tendencies to respond in a particular fashion regardless of the stimulus material, represent a constant threat to research validity. They tend to be most prevalent when test materials are difficult or instructions ambiguous. As item difficulty increases the set to gamble becomes more evident in response patterns. An impulsion set operates where there is an alternative to respond or not to respond; failure to answer being widely regarded by subjects as a reflection of some inadequacy on their part. The general tendency towards acquiescence is to some extent offset by people with negativistic sets. Researchers are still uncertain as to the difference in psychological qualities measured between those respondents who opt for speed and those who consider each item at considerable length.¹⁴ Subjects generally exhibit a preference for strong statements versus moderate or indecisive ones, and sequences of questions asked in very similar format tend to produce stereotyped response, such as a tendency to endorse the right hand or left hand response or to alternate in some simple fashion.

Sources of error also issue from the investigator. The

range of answers which the respondent is willing to provide is smaller when questions are posed by younger interviewers. Social class and sex exert similar effects on refusal rates and levels of response. The way in which the investigator presents himself may vary with time. Both a practice effect and a fatigue effect are operative with the result that subjects contacted later in the experiment tend to give answers more biased in the direction of the experimenter's hypothesis.¹⁵ Early data returns frequently have an effect on the analysis of subsequent data. The investigator may have increasingly strong expectations of what a respondent means and code differently with practice.

Modified Picture Frustration Test

The Rosenzweig Picture Frustration Study constitutes an attempted statement of Rosenzweig's frustrations theory in operational terms.¹⁶ What makes it preferable over other techniques is its ready adaptation for the simulation of problem-solving behaviour.

One of the greatest sources of inconvenience associated with the procedure is the lack of guidance as to how to ensure that the situations sampled are representative of the frustrating situations characteristic of the target population. Another problem relates to the level of response sampled by the method. It is not certain whether the subject's reactions reflect: a) his overt everyday behaviour as observed by others; b) his behaviour experienced subjectively but consciously by himself; c) his covert needs; or, d) his opinions on how he ought to behave. The assumption that the overt level has been tapped might be tenable as a gross probability statement for groups,

but is of little value in handling individual cases.¹⁷

Both previous studies and a limited experiment conducted for the study have indicated that interscorer consistency is fairly high. Internal consistency,¹⁸ on the other hand, is very often found to be low, but this bears little relevance to the study at hand due to the lack of on-the-spot coding. Evidence of empirical validity (or agreement between stated attitudes and subsequent actions) is somewhat ambiguous with test results distributed about equally among supportive, equivocal and non-supportive.¹⁹

Overall, the P-F test lacks the breadth and sensitivity of some other psychological tests, but for its limited purposes is perhaps as close to a model instrument as any projective technique currently in use.²⁰

Attitudes Versus Actions

All measurement of attitudes by the questionnaire technique proceeds on the assumption that there is a mechanical relationship between attitudes and actions. Yet after more than seventy-five years of attitude research, there is still little, if any, consistent evidence to support this hypothesis.²¹ The most commonly employed attitude measurement techniques seldom exceed a predictive power of fifty percent.²²

There is no innate relationship between attitude and behaviour; one still has to learn a behavioural response.²³ Although the attitude measuring instrument does sample the behavioural component of the attitude, this is no assurance that this behavioural inclination has or will be reinforced in an actual behavioural situation with its

complex stimuli. Attitudes must be recognized as purely underlying dispositions which enter, along with other influences,²⁴ into the determination of a variety of behaviours.²⁵

Overview of Methodological Appraisal

The methodological drawbacks of attitude measurement while considerable should not be interpreted as reason for their avoidance. With all the aforementioned difficulties, the perceived environment and environmental perception remain central to our ultimate geographical problems.²⁶ The investigator can most adequately ensure that measured attitudes and actions correspond if the stimulus material constitutes action which occurs frequently within the respondent's usual social circumstances.²⁷ The extensive range of biases native to self-report procedures can be largely overcome through "multiple operationism" or the use of complementary measurement instruments;²⁸ the use of a range of different measuring instruments to identify and exclude various patterns of irrelevant properties.²⁹ The objection is not so much over the lack of reliability of popular methods of attitude measurement, as the tendency towards overdependence on a single fallible method.

As regards the various aforementioned sources of bias, the author feels this study stands in reasonably good stead. Care was taken to avoid as much as possible the pitfalls of questionnaire design and the methodological restraints involved with projecting the results have been recognized. Testing was completed in the surroundings native to the subject matter discussed, and related almost exclusively to matters either normally handled or discussed by the respondents.

Interviewer-subject interaction was standardized wherever possible and notations of changes in procedure were made whenever they occurred. Finally, respondents were asked to play a specific role with which they were familiar, and assurances of confidence and anonymity were employed to ensure against insincerity.

The fact that multiple operationism was not instituted is regrettable but understandable in light of time constraints and the experimental nature of the methods employed.

REFERENCES AND FOOTNOTES

- 1 The organizational hierarchy proceeds upwards through section, branch, division and department, in that order.
- 2 The sample obtained (one Engineer and four Geographers) was not representative of the educational backgrounds of all those employed within the division.
- 3 For a complete description see: Saul Rosenzweig, "The Picture-Association Method and Its Application In a Study of Reactions to Frustration", Journal of Personality (1945-1946), Vol. 14, pp. 3-23; and S. Rosenzweig, E.E. Fleming and H.J. Clarke, "Revised Scoring Manual For the Rosenzweig Picture Frustration Study", Journal of Psychology (1947), Vol. 24, pp. 165-208.
- 4 The ego of the subject plays the chief part in the response, and the subject either blames someone else, assumes the blame, or describes the responsibility for the frustration as not attributable to anyone.
- 5 Respondents were instructed to assume the role of an overseer rather than a direct participant in the frustrating situation.
- 6 Which gives the respondent the option of answering on one of two possible levels; either dwelling upon the applicable legislation or acting as though it were non-existent.
- 7 For Cartoon Number Eleven most respondents were aware of the law prohibiting streamside harvest except under specific conditions, so that clearcutting the shoreline reservation was not really an acceptable alternative for them.
- 8 For example, the sub-types of "obstacle negation" are ON(1), ON(2), ON(3), ON(4), and ON(5).
- 9 Direction of aggression, an alternative basis for the ratio, is by comparison, optional in response coding.
- 10 Eugene J. Webb, et. al., Unobtrusive Measures: Nonreactive Research in the Social Sciences, Rand McNally and Company, Chicago, 1966, pp. 13-27.
- 11 Due to the extra care taken by respondents not to provide evidence supporting the hypothesis unless it seems totally warranted. See Martin T. Orne, "On the Psychology of the Psychological Experiment - With Particular Reference To Demand Characteristics And Their Implications", pp. 183-194 in Duane P. Schultz, The Science of Psychology: Critical Reflections, Appleton-Century-Crofts, New York, 1970.

- 12 Leo P. Crespi, "The Interview Effect in Polling", Public Opinion Quarterly (1948). Vol. 12, pp. 99-111.
- 13 This type of question was not used extensively in this study but whenever it was, analysis of the responses it stimulated are always considered the effects of its bias.
- 14 J.P. Guilford, "Response Biases and Response Sets", pp. 277-281 in Martin Fishbein (ed.), Readings In Attitude Theory and Measurement, John Wiley and Sons, New York, 1967.
- 15 Robert Rosenthal, "Covert Communication in The Psychological Experiment", pp. 195-211 in Duane P. Schultz, The Science of Psychology: Critical Reflections, Appleton-Century, Crofts, New York, 1970.
- 16 Oscar K. Buros (ed.), Fifth Mental Measurement Yearbook, Gryphon Press, Highland Park, New Jersey, 1959, p. 155.
- 17 Idem, Sixth Mental Measurement Yearbook, Gryphon Press, Highland Park, New Jersey, 1966, p. 512.
- 18 The degree to which scorers fall prey to such biases as the influence of early returns in the process of on-the-spot coding.
- 19 Buros, op. cit., p. 515.
- 20 Buros, Fifth Mental Measurement Yearbook, op. cit., p. 292.
- 21 Martin Fishbein, "Attitudes and Prediction of Behaviour", pp. 477-492 in M. Fishbein (ed.), Readings In Attitude Theory and Measurement, John Wiley and Sons, New York, 1967.
- 22 See for instance: C.R. Tittle and R.J. Hill, "Attitude Measurement and the Prediction of Behaviour: An Evaluation of Conditions and Measurement Techniques", Sociometry (1967), Vol. 30, pp. 199-213.
- 23 Fishbein, op. cit.
- 24 Other dispositions and values engaged by the situation, motivational state, perceived appropriate behaviour, expectations of others, and probable consequences of various acts.
- 25 S.W. Cook and C. Selltitz, "A Multiple Indicator Approach To Attitude Measurement", pp. 220-235 in M. Fishbein (ed.), Readings In Attitude Theory and Measurement. John Wiley and Sons, New York, 1967.
- 26 H.C. Brookfield, "The Environment As Perceived", pp. 51-80 in C. Board, et. al, (eds.), Progress In Geography, Vol. 2, Edward Arnold, London, 1971.
- 27 Tittle and Hill, op. cit., p. 201.

- 28 Roger M. Downs, "Geographic Space Perception: Past Approaches and Future Prospects", pp. 65-103 in C. Board, et. al. (eds.), Progress In Geography, Vol. 2, Edward Arnold, London, 1971.
- 29 Loc. cit.

CHAPTER V

DATA ANALYSIS

DESCRIPTIVE FINDINGS

Public managers of forested land in Alberta who were interviewed appear to represent a highly varied group. Biographical parameters measured included age, education, occupational experience, organizational affiliations, leisure-time activities and reading habits. Subjects were also requested to provide opinions as to:

1. the major reason for having entered their current field, and what knowledge or experience they found most useful in their present position;
2. the major problems facing Albertans today, in particular, the severity of forest land use conflicts and their primary causes;
3. their definition and source of awareness of conflicts on forested land, in addition to primary criteria for their solution;
4. their definition of the concept of multiple use, its worth, and the degree to which it has been successfully applied in Alberta;
5. the extent to which the people within their agency shared the same outlooks and opinions.

The answers to these questions were tabulated with the results that follow.

Biographical Descriptors

Sample respondents were found to range in age from twenty-four to fifty-five. (See Table 1.) Dividing the sample distribution into four groups of equal age intervals (seven years), it was found the age group twenty-four to thirty-one comprised about double the number of respondents as each of the other three age intervals. This may reflect the fact that many younger individuals either get a start in the Civil Service or find their positions unsatisfactory, but most likely, it simply reflects the rapid recent growth in relevant government agencies.

Post-secondary educational training showed considerable variation but four professional affiliations achieved a measure of dominance. (See Table 2.) Forestry, Agriculture, Geography and the Biological Sciences together accounted for two-thirds of stated affiliations with an additional 9.5% of respondents having established no clear association. The balance of respondents indicated a wide range of affiliations.

A breakdown of professional affiliation by agency yielded a simple "domination ratio" based on the proportion of sampled respondents within an agency which belonged to the most numerous professional grouping. (See Table 3.) Resultant proportions varied from .29 to 1.00 and averaged .67. Assuming that chosen respondents were representative of the professional distribution within the agency, these figures appear to indicate that professional domination of agencies is a fairly common occurrence.

The length of time respondents had occupied the position

Table 1

AGE DISTRIBUTION

| <u>Age Interval</u> | <u>Frequency</u> | <u>% Frequency</u> |
|---------------------|------------------|--------------------|
| 24 - 31 | 25 | 39.7 |
| 32 - 39 | 13 | 20.6 |
| 40 - 47 | 13 | 20.6 |
| 48 - 55 | 12 | 19.1 |

Response Rate: 87.5%

Table 2

PROFESSIONAL EDUCATIONAL AFFILIATION

| <u>Profession</u> | <u>Frequency</u> | <u>% Frequency</u> |
|------------------------------|------------------|--------------------|
| Forestry | 13 | 20.6 |
| Agriculture | 11 | 17.5 |
| Geography | 11 | 17.5 |
| Biological Sciences | 7 | 11.1 |
| Business Administration | 3 | 4.8 |
| Geology | 2 | 3.2 |
| Agriculture/Rural Sociology | 1 | 1.6 |
| Botany/Geology | 1 | 1.6 |
| Engineering | 1 | 1.6 |
| Forestry/Ecology | 1 | 1.6 |
| Forest Recreation | 1 | 1.6 |
| Forestry/Water Quality | 1 | 1.6 |
| Forestry/Wildlife Management | 1 | 1.6 |
| Geography/Agriculture | 1 | 1.6 |
| Resources Management | 1 | 1.6 |
| Watershed Science | 1 | 1.6 |
| No Clear Affiliation | 6 | 9.5 |

Response Rate: 87.5%

Table 3

PROFESSIONAL REPRESENTATION BY AGENCY

| <u>Agency</u> | <u>Professional Representation</u> | <u>Sample Professional Domination Ratio</u> |
|----------------------------|--|---|
| Timber Management | For (7) | 1.00 |
| Lands | Ag (5), No Aff (1) | .83 |
| Interdepartmental Planning | Ag (4), B Ad (1) | .80 |
| Provincial Planning | Geog (4), No Aff (1) | .80 |
| Water Resources | Geog (4), Eng (1) | .80 |
| Fish and Wildlife | BS (4), For/WM (1), RM (1), NA (1) | .67 |
| Multiple Land Use | Geog (3), BS (1), For (1), For/WG (1), NA (1) | .50 |
| Forest Land Use | For (3), Ag (1), FR (1), WM (1), No Aff (2) | .38 |
| Parks | B Ad (2), Ag (1), BS (1), Geog/Ag (1), No Aff (2) | .29 |
| | Average | .67 |

Response Rate: 87.5%

Key: Ag - Agriculture
 B Ad - Business Administration
 BS - Biological Sciences
 Eng - Engineering
 For - Forestry
 FR - Forest Recreation
 Geog - Geography
 NA - No Answer
 RM - Resources Management
 WM - Watershed Management
 WG - Water Quality

Table 4

LENGTH OF TENURE FOR CURRENT POSITION

| <u>Length of Tenure Interval</u> | <u>Frequency</u> | <u>% Frequency</u> |
|----------------------------------|------------------|--------------------|
| 0 - 2 years | 32 | 44.4 |
| 2 - 5 years | 16 | 22.2 |
| 6 - 10 years | 12 | 16.7 |
| 10+ years | 12 | 16.7 |

Response Rate: 100.0%

they held at the time of interview varied from three days to twenty-four years. (See Table 4.) The sample distribution displayed a predominance of individuals for whom it had been five or less years since their previous job transfer. Cross tabulation of age and job duration revealed that this tendency towards high occupational mobility was most likely the result of the heavy representation in the younger age brackets. (See Table 5.) It also suggested that as one's career progresses the tendency is to have longer periods of time to adjust to new positions. Less than half of the respondents had occupational experience foreign to their current work content. (See Table 6.) Half of those mentions related to experience in other fields of public resource management, about one-fifth to related private industry while the remainder pertained to other areas.

Organizational affiliations and reading habits were tabulated to show the proportion which related directly to professional education. (See Table 7.) The proportion of organizational affiliations which related directly ranged from fifty-seven to one-hundred percent, while the comparable percentages for relevant journals varied from thirty-eight to fifty-nine. The order of dependence on professional education was consistent for both memberships and reading material, proceeding from the Biological Sciences (with the greatest degree of dependence), through Agriculture, Forestry to Geography. Overall variations in dependence between professional groups were, however, only half as large as those for memberships. Overall dependence ratios were greater for organizations than for journals. These last two distinctions may simply be a reflection of the greater ease with which professional boundaries are breached via reading material, as opposed

Table 5

AGE VS. JOB DURATION

| Age Job Duration | 24 - 31 | 32 - 39 | 40 - 47 | 48 - 55 |
|------------------------|---------|---------|---------|---------|
| 0 - 2 years | 18 | 5 | 3 | 2 |
| 2+ - 5 years | 6 | 5 | 3 | 1 |
| 6 - 10 years | 1 | 1 | 5 | 4 |
| 10+ years | 0 | 1 | 2 | 5 |

Response Rate: 87.5%

Table 6

SUPPLEMENTARY OCCUPATIONAL EXPERIENCE

| <u>Type of Experience</u> | <u>Frequency</u> | <u>% Frequency</u> |
|--|------------------|--------------------|
| Other fields of public resource management | 14 | 22.2 |
| Related private industry | 6 | 9.5 |
| Unrelated industrial | 2 | 3.2 |
| Other | 7 | 11.1 |

Response Rate: 87.5%

Table 7PROPORTION OF ORGANIZATIONAL AFFILIATIONS
AND JOURNALS READ WHICH RELATE DIRECTLY TO
PROFESSIONAL EDUCATION BY PROFESSION

(with sample size in brackets)

| <u>Profession</u> | <u>% Organizations</u> | <u>% Journals</u> |
|---------------------|------------------------|-------------------|
| Agriculture | 85.7 (10) | 56.7 (10) |
| Forestry | 58.6 (12) | 50.0 (13) |
| Geography | 57.1 (9) | 38.0 (11) |
| Biological Sciences | 100.0 (4) | 58.8 (5) |

Average: 75.4%

Response Rate: 87.5%

Table 8

DISTRIBUTION OF OUTDOOR RECREATION SCORES

| <u>Score Interval</u> | <u>Frequency</u> | <u>% Frequency</u> |
|-----------------------|------------------|--------------------|
| 1-3 | 21 | 38.2 |
| 4-6 | 23 | 41.8 |
| 7+ | 11 | 20.0 |

Response Rate: 76.4%

to organizational affiliations.

A sampling of leisure-time activities was performed to provide some measure of the respondent's recreational contact with the forested lands he helped to manage. (See Table 8.) All respondents indicated at least one group of outdoor recreation activities which could potentially occur in a forested environment. About one in every five indicated a level of interest which could be interpreted as high (though not with any dependability due to the lack of a standard for comparison). Scores were derived by a simple ranking of leisure activities. Scores varied inversely as rank and were accumulated to form a total for each respondent.

Occupational Motivation and Perceived Value
of Prior Education and Experience

When asked what knowledge or experience acquired prior to entering their current posts they had found particularly valuable in their work, the greater portion of respondents indicated some form of on-the-job training. (See Table 9.) Next in order of importance was education, followed by personal attributes. These results were to a certain degree reinforced by the reasons given by respondents for having entered their present field. (See Table 10.) Education and training did place second in importance (representing 18.0% of all answers given), but was vastly overshadowed by work content (50.8%). Other major reasons given included personal contacts, chance, calling and working conditions.

It would appear respondents feel that their education and training play a relatively minor role in conditioning job selection

Table 9

VALUABLE KNOWLEDGE OR EXPERIENCE

| | <u>Frequency</u> | <u>% Frequency</u> |
|-----------------------|------------------|--------------------|
| On the job experience | 40 | 50.8 |
| Education | 14 | 23.0 |
| Personal attributes | 7 | 11.5 |

Response Rate: 84.7%

Table 10

MAJOR REASON FOR ENTERING PRESENT FIELD

| <u>Reason</u> | <u>Frequency</u> | <u>% Frequency</u> |
|--------------------|------------------|--------------------|
| Work content | 31 | 50.8 |
| Education/Training | 11 | 18.0 |
| Personal contacts | 7 | 11.5 |
| Chance | 4 | 6.6 |
| Calling | 4 | 6.6 |
| Working conditions | 2 | 3.3 |
| Other | 2 | 3.3 |

Response Rate: 84.7%

Table 11 MAJOR PROBLEMS RELATING TO MANAGEMENT OF FORESTED LANDS

| <u>Problem</u> | <u>Frequency</u> | <u>% Frequency</u> |
|---|------------------|--------------------|
| Lack of long term interdepartmental planning | 15 | 9.8 |
| Environmental quality | 9 | 6.0 |
| Land use conflicts/lack of basic resource data | 8 | 5.3 |
| Depletion of natural resources without equitable return | 7 | 4.7 |
| Lack of inter-group coordination in resource management | 4 | 2.7 |
| Failure to account for extra-market values | 3 | 2.0 |
| Other | 21 | 13.8 |
| Total mention of forested related problems | 67 | 43.8 |
| Total respondents involved | 47 | 65.2 |

and subsequent work attitudes. Whether or not this factor is operative at a subconscious level remains to be determined. The dominance of work content (as opposed to a roughly equal distribution between it and education) is bewildering in light of the effect that educational background would logically have on preferred work content.

Major Problems

An open-ended query requesting a listing of major problems faced by Albertans yielded sixty-seven responses which related directly to the field of forest resources management. (See Table 11.) A total of forty-seven respondents (65.2%) made at least one such reference. Relevant responses mentioned most frequently included: lack of long-term interdepartmental planning; environmental quality; land use conflicts; lack of basic resource data; and, depletion of natural resources without equitable return. A follow-up multiple choice question requesting specifically a ranking of forest management problems relative to other problems faced in Alberta yielded results that could be considered at variance. (See Table 12.) The modal group was "important" with the categories "somewhat important" and "very important" being chosen with roughly equal frequency. Answer patterns from both types of question appear to support the hypothesis that forest resource managers hold the problems with which they are concerned as being of considerable importance to society.

A breakdown of this ranking was tabulated on the basis of agency. (See Table 13.) Average scores ranged from 2.3 to 3.4 within an empirical range¹ from 1.7 to 4.0. It is interesting to note that while three of the five highest scoring agencies are involved exclusively with

Table 12 RANK FOREST MANAGEMENT PROBLEMS RELATIVE TO OTHERS

| <u>Response</u> | <u>Frequency</u> | <u>% Frequency</u> |
|----------------------|------------------|--------------------|
| Of little importance | 1 | 1.4 |
| Somewhat important | 22 | 30.6 |
| Important | 29 | 40.3 |
| Very important | 20 | 27.8 |

Response Rate: 100.0%

Table 13 RANK OF FOREST MANAGEMENT PROBLEMS BY AGENCY

(based on ordinal summations; e.g., little importance = 1, very important = 4)

| <u>Agency</u> | <u>Average Score</u> |
|------------------------------------|----------------------|
| Forest Land Use | 3.4 |
| Interdepartmental Planning | 3.3 |
| Multiple Land Use | 3.3 |
| Timber Management | 3.3 |
| Parks | 3.3 |
| Strip Coal Advisory Committee | 3.0 |
| Fish and Wildlife | 2.7 |
| Environment Conservation Authority | 2.7 |
| Land Use Assignment Committee | 2.7 |
| Mines and Minerals | 2.7 |
| Lands | 2.4 |
| Water Resources | 2.3 |
| Overall average | 2.9 |

Response Rate: 100.0%

Table 14 INCREASING CONCERN OVER CONFLICTS

| | <u>Frequency</u> | <u>% Frequency</u> |
|--|------------------|--------------------|
| Not Justified | 9 | 12.5 |
| Justified (due to . . .) | 63 | 87.5 |
| 1) increased demand and number of demands; hence potential for conflict | 20 | 27.8 |
| 2) past and/or present management inadequate | 25 | 34.7 |
| 3) importance of concern | 10 | 13.9 |
| 4) difficulty of avoiding conflicts | 9 | 12.5 |
| 5) fault of public | 8 | 11.1 |
| 6) changing value systems | 1 | 1.4 |

Response Rate: 100.0%

forested areas, five of the six lowest scoring agencies are in large part concerned with areas outside the forested zone. This appears to support the hypothesis that perceived importance of forest management varies directly as the degree of involvement of the respondent's agency with such matters. However, the crudeness of the criteria and the relatively small range of average scores make this finding tentative.

Forest Land Use Conflicts

Seven-eighths of all respondents felt that a postulated increasing concern over forest land use conflicts was justified, and reasons given fell into five major categories. (See Table 14.) Increasing demand and inadequacies of past or present management both accounted for about thirty percent of reasons given. Other prominent response types focused on the importance of the concern, the difficulty of avoiding conflicts, or blaming the public. This would appear to be a strong endorsement of the importance of forest land use conflicts but the potential effect of a preamble which assumes the existence of a concern should not be ignored regardless of the problematical and conditional terms in which it is expressed.

Definitions of forest land use conflicts revealed that the concept is potentially multidimensional in nature. Conflicts were variously perceived on the ground level as involving deleterious effects of one use on another (51.4%), at the level of conflicting demands (22.2%), as the result of opposing points of view (20.8%), or suboptimal land management (9.7%), or finally, misconception of objectives by demanding groups (1.4%). This multiplicity of conceptions concerning forest land use conflicts has the potential of causing a good deal of

inefficiency in any attempts to resolve conflicts. Lack of mutual understanding was further emphasized by frequently witnessed difficulty in defining the term. There was a strong tendency to list examples despite reassertions that a definition was required, and in three instances this was all that could be had, despite prodding. Three other respondents failed to answer the question altogether.

Four major sources of awareness for conflicts were indicated: complaints from the public (27.0%), from within the department (19.6%), from other departments (18.0%), and from personal observations (17.5%). (See Table 16.) Less important sources included mass media, public meetings and casual conversation with friends. It had originally been intended to correlate definitions and sources of awareness, but the variety of responses and degree of generalization involved in classification would have negated any meaningfulness in such a comparison.

A wide variety of criteria were stated by respondents as most important in the resolution of forest management problems. Of dominant importance were environmental and economic criteria, together accounting for approximately seventy percent of stated importance. (See Table 17.) Eight other criteria categories ranging from public opinion to physical capacity consumed the remainder of responses. A simple listing of response types, however, disguises the actual response process. Early attempts to procure answers without the aid of suggestive categories were largely failures. Respondents left to their own, resorted to vague expressions of optimality suggestive of no particular interpretation. Subsequent responses keyed to suggestions merely encouraged largely arbitrary choices between alternatives which appeared

Table 15

DEFINITION OF FOREST LAND USE CONFLICT

| <u>Definition</u> | <u>Frequency</u> | <u>% Frequency</u> |
|---|------------------|--------------------|
| Deleterious effect on other uses | 37 | 51.4 |
| Conflicting demands | 16 | 22.2 |
| Opposing points of view | 15 | 20.8 |
| Suboptimal land management | 7 | 9.7 |
| Misconception of objectives by demanding groups | 1 | 1.4 |
| Examples only | 3 | 4.2 |
| No answer | 3 | 4.2 |

Response Rate: 95.8%

Table 16

SOURCE OF AWARENESS FOR CONFLICTS

| <u>Source</u> | <u>Frequency</u> | <u>% Frequency</u> |
|----------------------------------|------------------|--------------------|
| Complaints from public | 51 | 27.0 |
| Within department | 37 | 19.6 |
| Other departments | 34 | 18.0 |
| Personal observations | 33 | 17.5 |
| Mass Media | 17 | 9.0 |
| Public meetings | 11 | 5.8 |
| Casual conversation with friends | 6 | 3.2 |

Response Rate: 100.0%

Table 17

MOST IMPORTANT CRITERIA

| <u>Criterion</u> | <u>Score</u> | <u>% Frequency</u> |
|--|--------------|--------------------|
| Environmental (ecological/aesthetic) | 99 | 36.8 |
| Economic (including long-term and regional) | 85½ | 31.8 |
| Public opinion | 19½ | 7.2 |
| No one/a happy blend | 15 | 5.6 |
| Physical/biophysical capability | 14 | 5.2 |
| Socioeconomic implications | 9 | 3.3 |
| Depends on situation/any one could predominate | 9 | 3.3 |
| Conservation/sustained yield | 7 | 2.6 |
| Political | 6 | 2.2 |
| Technical | 2½ | .9 |
| Total output | 2½ | .9 |

Response Rate: 95.8%

unrelated to any prior commitment.

Multiple Use and the Perceived Homogeneity
of Attitudes and Opinions

In light of the natural tendency for coincident increases in demand, land use conflicts and the need to practice multiple use (in one form or another), it is interesting to measure certain attitudes towards the concept of multiple use. Resources management literature abounds with positive and negative responses² but virtually all admit the difficulty of definition and application which engulfs the concept.

Respondents were asked to choose among three alternative definitions of multiple use with the option of fabricating an original definition should none of those offered meet with the respondent's approval. The alternatives provided were not meant to cover all disputable components of the concept; they were only meant to tap the most superficial level as a measure of the degree of agreement among civil servants.

Results revealed a wide dispersal of opinion. (See Table 18.) "Simultaneous mix of uses" compiled the greatest number of votes but "sequence and/or simultaneous", "single use zoning or simultaneous", and "sequence of single uses" also figured prominently. It seems apparent from this sampling that despite the Alberta Government's official adherence to the principle of multiple use management, its employees who are most concerned with it, lack a common consensus as to its meaning.

Respondents were further asked to appraise the potential worth of the concept and the degree of success with which it has been applied in Alberta. They indicated a high level of regard for the

Table 18

DEFINITION OF MULTIPLE USE

| <u>Definition</u> | <u>Frequency</u> | <u>% Frequency</u> |
|----------------------------------|------------------|--------------------|
| Zoning for single use | 4 | 6.5 |
| Sequence of single uses | 9 | 14.5 |
| Simultaneous mix of uses | 29 | 46.8 |
| Sequence and/or simultaneous | 13 | 21.0 |
| Zoning or simultaneous | 11 | 17.7 |
| Zoning, sequence or simultaneous | 5 | 8.1 |
| Other | 1 | 1.6 |

Response Rate: 84.7%

Table 19

WORTH OF MULTIPLE USE

| <u>Perceived Value</u> | <u>Frequency</u> | <u>% Frequency</u> |
|------------------------|------------------|--------------------|
| No worth | 1 | 1.4 |
| Some worth | 12 | 16.7 |
| Considerable worth | 28 | 38.8 |
| Great worth | 31 | 43.1 |

Response Rate: 100.0%

Table 20CONCERN OVER CONFLICTS JUSTIFIED VS.
WORTH OF MULTIPLE USE

(based on assumption of equal intervals between worth classes, with "no worth" = 1, "great worth" = 4).

| <u>Justified?</u> | <u>Average Worth of Multiple Use</u> |
|-------------------|--------------------------------------|
| Yes | 3.3 |
| No | 3.4 |

Response Rate: 100.0%

Table 21

APPLICATION OF MULTIPLE USE IN ALBERTA SUCCESSFUL?

| <u>Response</u> | <u>Frequency</u> | <u>% Frequency</u> |
|-----------------------|------------------|--------------------|
| Successful | 26 | 24.3 |
| Moderately successful | 40 | 37.4 |
| Developmental stages | 17 | 15.9 |
| Not successful | 24 | 22.4 |

Response Rate: 95.8%

potential worth of the concept despite greatly varied definitions with eighty-two percent of the responses falling in the categories "great worth" and "considerable worth". (See Table 19.) Cross-tabulation of the perceived worth of multiple use with whether or not increased concern over conflicts was justified (Table 20) showed no meaningful distinction. It would appear that multiple use is regarded as a desirable end in itself, rather than merely a means to some resource management objective. It is perhaps this attitude which makes the concept so elusive of comprehension and common consensus.

Appraisal of the degree of success with which multiple use has been applied in Alberta was largely indecisive. (See Table 21.) Respondents answering either that it was moderately successful or that it was still in its developmental stages accounted for over half the evaluations with definite "yes" or "no" answers sharing the remainder roughly equally.

A wide variety of barriers to such a successful application were mentioned. (See Table 22.) The most important groupings involved a general lack of policy, planning, legislation and controls (24.7%), the related problems of poor definition of authority, poor coordination and communication, and departmental parochialism (20.8%), political expediency and the low priority afforded new resources (20.8%), and the difficulty of applying the concept (19.5%).

When asked to what extent they felt the people within their agency shared the same attitudes and opinions regarding the management of forested lands, respondents were in general agreement that there was considerable similarity. (See Table 23.) The categories "some similarity" and "great similarity" were both about half as important.

Table 22 MAJOR BARRIERS TO SUCCESSFUL APPLICATION OF
MULTIPLE USE IN ALBERTA

| | <u>Frequency</u> | <u>% Frequency</u> |
|--|------------------|--------------------|
| Problem of computing comparative values | 10 | 13.0 |
| Low priority of new resources uses | 9 | 11.7 |
| Legacy of past allocations | 7 | 9.1 |
| Lack of coordination and communication | 7 | 9.1 |
| Political decisions and political pressure from industry and the public | 7 | 9.1 |
| Departmental parochialism | 6 | 7.8 |
| Lack of planning | 5 | 6.5 |
| Public refusal to recognize need to make sacrifices | 5 | 6.5 |
| Lack of government policy and direction | 5 | 6.5 |
| Concept difficult to define or employ | 3 | 3.9 |
| Delegation of authority poorly defined | 3 | 3.9 |
| Insufficient data on interactions and tolerances | 2 | 2.6 |
| Inadequate legislation and controls | 2 | 2.6 |
| Other | 6 | 7.8 |

Response Rate:

Table 23 OUTLOOKS AND OPINIONS OF AGENCY MEMBERS

| <u>Degree of Similarity</u> | <u>Frequency</u> | <u>% Frequency</u> |
|-----------------------------|------------------|--------------------|
| Little similarity | 1 | 1.4 |
| Some similarity | 16 | 22.5 |
| Considerable similarity | 37 | 52.1 |
| Great similarity | 17 | 23.9 |

Response Rate: 98.6%

By individual agency scores varied from 2.5 to 3.4. (See Table 24.)

Table 24 AVERAGE PERCEIVED SIMILARITY OF OUTLOOKS AND
OPINIONS OF AGENCY MEMBERS BY AGENCY

(based on assumption of equal intervals between similarity classes
with little similarity = 1, some similarity = 2, etc.)

| <u>Agency</u> | <u>Average Score</u> |
|------------------------------------|----------------------|
| Interdepartmental Planning | 3.4 |
| Forest Land Use | 3.4 |
| Fish and Wildlife | 3.3 |
| Environment Conservation Authority | 3.0 |
| Mines and Minerals | 3.0 |
| Timber Management | 2.9 |
| Lands | 2.9 |
| Parks | 2.9 |
| Provincial Planning | 2.8 |
| Land Use Assignment Committee | 2.8 |
| Strip Coal Advisory Committee | 2.8 |
| Multiple Land Use | 2.7 |
| Water Resources | 2.5 |

Response Rate: 100.0%

Table 31 PERCEIVED AND MEASURED LEVELS OF AGENCY
HOMOGENEITY - COMPARITIVE ORDERING

| <u>Perceived Ordering</u> | <u>Agency</u> | <u>Measured Ordering</u> | <u>Displacement</u> |
|---------------------------|----------------------------|--------------------------|---------------------|
| 1 | Interdepartmental Planning | 2 | 1 |
| | Forest Land Use | 9 | 8 |
| 3 | Fish and Wildlife | 3 | - |
| 4 | Timber Management | 8 | 4 |
| | Lands | 5 | 1 |
| | Parks | 7 | 3 |
| 7 | Provincial Planning | 1 | 6 |
| 8 | Multiple Land Use | 6 | 2 |
| 9 | Water Resources | 3 | 6 |

ANALYSIS OF PICTURE FRUSTRATION RESULTS

The following section is devoted to tabulation, cross-tabulation and explanation of aggregate returns from Section B of the questionnaire. The sequence of data treatment will begin with overall totals for each cartoon and then cover response tendencies by professional affiliation, agency, age group, and outdoor recreation score, in that order. The effects of agency and professional affiliation will be further analyzed by response tendencies for individual cartoons. Finally, an attitudinal conformity measure will be computed in which the ratings of individual agencies and professions will be compared.

Summaries of Individual Cartoons

(See Table 25)

The first cartoon accepted for analytical purposes involved the closure of high altitude forests to timber operations in order to ensure control of late season snow melt. Respondents generally were resigned to this exclusion and occasionally mentioned that timber operations in such areas would provide no worthwhile return anyway. The problem was for the most part regarded as a matter of choosing between mutually exclusive alternatives; control of run-off being the more highly regarded. A lesser number stressed use conciliation in either a general or specific manner, and a small portion stated that timber operations would actually enhance the end of run-off control. Indications of blame or responsibility for solving the problem were almost totally absent.

In Cartoon Number Four, graziers were accused of having incurred additional costs to timber operators. The most prevalent

Table 25 FREQUENCY OF OCCURRENCE OF RESPONSE TYPES EXPRESSED AS
AGGREGATE AND AS PERCENT OF TOTAL SAMPLE

Cartoon No. 1

| | # | % | | # | % | | # | % |
|----------|------|------|----------|------|------|----------|------|------|
| ON(1) | - 3 | 4.8 | OD | - 1 | 1.6 | NP(S-1) | - 11 | 17.7 |
| ON(2) | - 2 | 3.2 | OD(1) | - 38 | 61.1 | S-1 | - 9 | 14.5 |
| ON(3) | - 6 | 9.7 | OD(2) | - 5 | 8.1 | S-3/1 | - 1 | 1.6 |
| ON(4) | - 1 | 1.6 | OD(6) | - 10 | 16.1 | Total NP | - 21 | 34.0 |
| ON(5) | - 8 | 12.9 | Total OD | - 54 | 87.1 | | | |
| Total ON | - 20 | 32.3 | | | | | | |

RS-IntroP - 2

Cartoon No. 4

| | # | % | | # | % | | # | % |
|----------|------|------|----------|------|------|----------|------|------|
| ON(1) | - 5 | 7.6 | OD | - 12 | 18.2 | NP(S-1) | - 4 | 6.1 |
| ON(2) | - 9 | 13.6 | OD(1) | - 3 | 4.5 | S-1 | - 6 | 9.1 |
| ON(3) | - 4 | 6.1 | OD(2) | - 1 | 1.5 | S-3 | - 9 | 13.6 |
| ON(5) | - 1 | 1.5 | OD(4) | - 4 | 6.1 | S-4 | - 13 | 19.7 |
| Total ON | - 19 | 28.8 | OD(6) | - 2 | 3.0 | S-3/1 | - 5 | 7.6 |
| | | | Total OD | - 22 | 33.3 | Total NP | - 37 | 56.1 |

| | # | % |
|-----------|------|------|
| ExtraP(1) | - 23 | 34.8 |
| ExtraP(2) | - 5 | 7.6 |
| IntroP | - 3 | 4.5 |
| Imp | - 1 | 1.5 |
| Total RO | - 32 | 46.4 |

| | # | % |
|--------------|------|------|
| ExtraP(1) | - 1 | 1.5 |
| IntroP | - 22 | 33.3 |
| ExtraP(1)(2) | - 3 | 4.5 |
| Total RS | - 26 | 39.4 |

Cartoon No. 5

| | # | % | | # | % | | # | % |
|----------|------|------|----------|------|------|----------|------|------|
| ON(1) | - 12 | 17.7 | OD | - 25 | 36.8 | NP(S-1) | - 1 | 1.5 |
| ON(2) | - 3 | 4.4 | OD(5) | - 3 | 4.4 | S-1 | - 26 | 38.2 |
| Total ON | - 15 | 22.1 | OD(7) | - 9 | 13.2 | S-2 | - 1 | 1.5 |
| | | | Total OD | - 37 | 54.4 | Total NP | - 28 | 41.2 |

| | # | % |
|---------------|------|------|
| ExtraP(1) | - 13 | 19.1 |
| IntroP | - 13 | 19.1 |
| ExtraP(1)/ | | |
| IntroP | - 2 | 2.9 |
| ExtraP(1)(2)/ | | |
| IntroP | - 1 | 1.5 |
| Imp | - 6 | 8.8 |
| Total RO | - 35 | 51.5 |

| | # | % |
|-----------|------|------|
| IntroP | - 21 | 30.9 |
| IntroP/ | | |
| ExtraP(1) | - 2 | 2.9 |
| ExtraP(1) | - 1 | 1.5 |
| Total RS | - 25 | 36.8 |

Cartoon No. 6

| | # | % | | # | % | | # | % |
|----------|------|------|----------|------|------|----------|------|------|
| ON(1) | - 32 | 47.8 | OD | - 21 | 31.4 | NP(S-1) | - 3 | 4.5 |
| ON(2) | - 2 | 3.0 | OD(1) | - 8 | 11.9 | S-1 | - 20 | 29.9 |
| ON(3) | - 22 | 32.9 | OD(3) | - 2 | 3.0 | S-2 | - 1 | 1.5 |
| Total ON | - 56 | 83.6 | OD(5) | - 1 | 1.5 | S-3 | - 2 | 3.0 |
| | | | Total OD | - 32 | 47.8 | Total NP | - 26 | 38.8 |

| | # | % | | # | % |
|--------------|------|------|----------|------|------|
| ExtraP(2) | - 32 | 47.8 | IntroP | - 22 | 32.9 |
| ExtraP(1)(2) | - 1 | 1.5 | Total RS | - 22 | 32.9 |
| ExtraP(1) | - 3 | 4.5 | | | |
| Total RO | - 36 | 53.8 | | | |

Cartoon No. 7

| | # | % | | # | % | | # | % |
|----------|------|------|----------|------|------|----------|------|------|
| ON(1) | - 10 | 14.9 | OD | - 15 | 22.4 | S-3/1 | - 2 | 3.0 |
| ON(2) | - 9 | 13.4 | OD(2) | - 1 | 1.5 | NP(S-1) | - 10 | 14.9 |
| Total ON | - 19 | 28.4 | OD(6) | - 6 | 9.0 | S-1 | - 23 | 34.4 |
| | | | Total OD | - 22 | 32.9 | S-3 | - 3 | 4.5 |
| | | | | | | Total NP | - 38 | 56.8 |

| | # | % | | # | % |
|--------------|------|------|------------|------|------|
| ExtraP(1) | - 16 | 23.9 | ExtraP(1) | - 15 | 22.4 |
| ExtraP(2) | - 1 | 1.5 | IntroP | - 9 | 13.4 |
| ExtraP(1)(2) | - 7 | 10.5 | ExtraP(1)/ | | |
| ExtraP(1)/ | | | IntroP | - 2 | 3.0 |
| IntroP | - 1 | 1.5 | Total RS | - 26 | 38.8 |
| Total RO | - 25 | 37.3 | | | |

Cartoon No. 12

| | # | % | | # | % | | # | % |
|----------|------|------|----------|------|------|----------|------|------|
| ON(1) | - 15 | 23.1 | OD | - 27 | 41.6 | NP(S-1) | - 11 | 16.9 |
| ON(2) | - 4 | 6.2 | OD(1) | - 4 | 6.2 | S-1 | - 9 | 13.9 |
| ON(3) | - 1 | 1.5 | OD(3) | - 6 | 9.2 | Total NP | - 20 | 30.8 |
| Total ON | - 20 | 30.8 | OD(5) | - 1 | 1.5 | | | |
| | | | OD(6) | - 5 | 7.7 | | | |
| | | | OD(7) | - 3 | 4.6 | | | |
| | | | Total OD | - 36 | 55.4 | | | |

| | # | % | | # | % |
|-----------|-----|------|-----------|------|------|
| IntroP | - 5 | 7.7 | IntroP | - 10 | 15.4 |
| Imp | - 1 | 1.5 | ExtraP(1) | - 1 | 1.5 |
| ExtraP(1) | - 2 | 4.6 | IntroP/ | | |
| Total RO | - 8 | 13.8 | ExtraP(1) | - 1 | 1.5 |
| | | | Total RS | - 12 | 18.5 |

Cartoon No. 13

| | # | % | | # | % | | # | % |
|-----------|-------------|-------------|-----------|-------------|-------------|----------|-------------|-------------|
| ON(1) | - 39 | 59.1 | OD | - 21 | 31.8 | NP(S-1) | - 2 | 3.0 |
| ON(2) | - 4 | 6.1 | OD(1) | - 6 | 9.1 | S-1 | - 6 | 9.1 |
| ON(3) | - <u>15</u> | <u>22.7</u> | OD(2) | - 6 | 9.1 | S-3 | - 1 | 1.5 |
| Total ON | - <u>58</u> | <u>87.9</u> | OD(3) | - 1 | 1.5 | S-3/1 | - <u>1</u> | <u>1.5</u> |
| | | | OD(5) | - 12 | 18.2 | Total NP | - <u>10</u> | <u>15.2</u> |
| | | | OD(6) | - <u>1</u> | <u>1.5</u> | | | |
| | | | Total OD | - <u>47</u> | <u>71.2</u> | | | |
| | | | | | | | | |
| | # | % | | # | % | | # | % |
| ExtraP(1) | - 1 | 1.5 | ExtraP(1) | - 1 | 1.5 | | | |
| ExtraP(2) | - 2 | 3.0 | IntroP | - 3 | 4.5 | | | |
| IntroP | - <u>2</u> | <u>3.0</u> | IntroP/ | | | | | |
| Total RO | - <u>5</u> | <u>7.6</u> | ExtraP(2) | - <u>1</u> | <u>1.5</u> | | | |
| | | | Total RS | - <u>5</u> | <u>7.6</u> | | | |

Cartoon No. 14

| | # | % | | # | % | | # | % |
|-----------|-------------|-------------|------------|-------------|-------------|----------|-------------|-------------|
| ON(1) | - 7 | 10.6 | OD(2) | - 1 | 1.5 | S-4 | - 3 | 4.5 |
| ON(2) | - <u>4</u> | <u>6.1</u> | OD | - 15 | 22.7 | NP(S-1) | - 10 | 15.2 |
| Total ON | - <u>11</u> | <u>16.7</u> | OD(5) | - 2 | 3.0 | S-1 | - 22 | 33.3 |
| | | | OD(6) | - 3 | 4.5 | S-2 | - 3 | 4.5 |
| | | | OD(7) | - <u>2</u> | <u>3.0</u> | S-3 | - <u>3</u> | <u>4.5</u> |
| | | | Total OD | - <u>23</u> | <u>34.8</u> | Total NP | - <u>40</u> | <u>60.6</u> |
| | | | | | | | | |
| | # | % | | # | % | | # | % |
| ExtraP(1) | - 20 | 30.3 | ExtraP(1) | - 3 | 4.5 | | | |
| IntroP | - 5 | 7.6 | ExtraP(2) | - 1 | 1.5 | | | |
| Imp | - <u>2</u> | <u>3.0</u> | IntroP | - 15 | 22.7 | | | |
| Total RO | - <u>27</u> | <u>34.8</u> | ExtraP(1)/ | | | | | |
| | | | IntroP | - <u>1</u> | <u>1.5</u> | | | |
| | | | Total RS | - <u>20</u> | <u>30.3</u> | | | |

Cartoon No. 15

| | # | % | | # | % | | # | % |
|--------------|-------------|-------------|--------------|-------------|-------------|----------|-------------|-------------|
| ON(1) | - 10 | 15.4 | OD | - <u>19</u> | <u>29.2</u> | NP(S-1) | - 9 | 13.9 |
| ON(2) | - <u>3</u> | <u>4.6</u> | Total OD | - <u>19</u> | <u>29.2</u> | S-1 | - 7 | 10.8 |
| Total ON | - <u>13</u> | <u>20.1</u> | | | | S-3 | - 3 | 4.6 |
| | | | | | | S-4 | - <u>22</u> | <u>33.9</u> |
| | | | | | | Total NP | - <u>41</u> | <u>63.1</u> |
| | | | | | | | | |
| | # | % | | # | % | | # | % |
| ExtraP(1) | - 33 | 50.8 | ExtraP(1) | - 8 | 12.3 | | | |
| ExtraP(2) | - 3 | 4.6 | ExtraP(2) | - 6 | 9.2 | | | |
| ExtraP(3) | - 6 | 9.2 | IntroP | - 8 | 12.3 | | | |
| ExtraP(1)(2) | - 4 | 6.2 | ExtraP(1)(2) | - 3 | 4.6 | | | |
| ExtraP(1)(3) | - 1 | 1.5 | ExtraP(2)/ | | | | | |
| Imp | - 4 | 6.2 | IntroP | - <u>1</u> | <u>1.5</u> | | | |
| IntroP | - <u>1</u> | <u>1.5</u> | Total RS | - <u>26</u> | <u>40.2</u> | | | |
| Total RO | - <u>52</u> | <u>80.0</u> | | | | | | |

Cartoon No. 16

| | # | % | | # | % | | # | % |
|-----------|-------------|-------------|-----------|-------------|-------------|----------|-------------|-------------|
| ON(1) | - 2 | 3.0 | OD | - 35 | 53.0 | NP(S-1) | - 7 | 10.6 |
| Total ON | - <u>2</u> | <u>3.0</u> | OD(5) | - <u>1</u> | <u>1.5</u> | S-1 | - 19 | 28.8 |
| | | | Total OD | - <u>36</u> | <u>54.5</u> | S-2 | - 4 | 6.1 |
| | | | | | | S-3 | - 2 | 3.0 |
| | | | | | | S-4 | - 9 | 13.6 |
| | | | | | | Total NP | - <u>41</u> | <u>62.1</u> |
| | | | | | | | | |
| | # | % | | # | % | | # | % |
| ExtraP(1) | - 48 | 72.8 | IntroP | - 23 | 34.8 | | | |
| IntroP | - 1 | 1.5 | ExtraP(1) | - <u>5</u> | <u>7.6</u> | | | |
| Imp | - <u>1</u> | <u>1.5</u> | Total RS | - <u>28</u> | <u>42.4</u> | | | |
| Total RO | - <u>50</u> | <u>75.8</u> | | | | | | |

Cartoon No. 17

| | # | % | | # | % | | # | % |
|-----------|-------------|-------------|----------|-------------|-------------|----------|-------------|-------------|
| ON(1) | - 7 | 10.3 | OD | - 20 | 29.4 | NP(S-1) | - 4 | 5.9 |
| ON(2) | - 9 | 13.2 | OD(2) | - 2 | 2.9 | S-1 | - 19 | 28.0 |
| ON(3) | - <u>1</u> | <u>1.5</u> | OD(6) | - <u>2</u> | <u>2.9</u> | S-3 | - <u>15</u> | <u>22.1</u> |
| Total ON | - <u>17</u> | <u>25.0</u> | Total OD | - <u>24</u> | <u>35.2</u> | Total NP | - <u>38</u> | <u>55.9</u> |
| | | | | | | | | |
| | # | % | | # | % | | # | % |
| ExtraP(1) | - 7 | 10.3 | IntroP | - <u>33</u> | <u>45.3</u> | | | |
| ExtraP(2) | - 11 | 16.2 | Total RS | - <u>33</u> | <u>45.3</u> | | | |
| IntroP | - 3 | 5.9 | | | | | | |
| ExtraP(3) | - <u>2</u> | <u>1.5</u> | | | | | | |
| Total RO | - <u>23</u> | <u>33.9</u> | | | | | | |

Cartoon No. 19

| | # | % | | # | % | | # | % |
|----------------------|-------------|-------------|-----------|-------------|-------------|----------|-------------|-------------|
| ON(1) | - 19 | 29.7 | OD | - 30 | 46.9 | NP(S-1) | - 2 | 3.1 |
| ON(2) | - <u>17</u> | <u>26.6</u> | OD(1) | - <u>3</u> | <u>4.7</u> | S-1 | - 8 | 12.5 |
| Total ON | - <u>36</u> | <u>56.3</u> | Total OD | - <u>33</u> | <u>51.6</u> | S-3 | - 3 | 4.7 |
| | | | | | | S-3/1 | - <u>1</u> | <u>1.6</u> |
| | | | | | | Total NP | - <u>14</u> | <u>21.8</u> |
| | | | | | | | | |
| | # | % | | # | % | | # | % |
| ExtraP(1) | - 3 | 4.7 | IntroP | - 10 | 15.6 | | | |
| ExtraP(2) | - 3 | 4.7 | ExtraP(2) | - 1 | 1.6 | | | |
| ExtraP(3) | - 5 | 7.8 | ExtraP(3) | - <u>1</u> | <u>1.6</u> | | | |
| IntroP | - 5 | 7.8 | Total RS | - <u>12</u> | <u>18.8</u> | | | |
| Imp | - 10 | 15.6 | | | | | | |
| IntroP/ ExtraP(1) | - <u>1</u> | <u>1.6</u> | | | | | | |
| Total RO | - <u>27</u> | <u>42.2</u> | | | | | | |

N.B. - For an explanation of the above mentioned abbreviated terms, see Appendix B: Picture Frustration Coding.

response tendency was to blame the grazier for the problem and emphasize the need for government officials to either penalize or exclude the offending party. A smaller grouping either felt resigned to the problem or denied it altogether.

Cartoon Number Five featured an attack on oil firms for consuming more forested land for access than would be necessary with careful planning. Blame for this obstacle was equally divided between the oil firms and government agencies responsible for review of proposed access routes. Respondents were split as to whether the problem could be overcome, with somewhat more emphasis on the obstacle than the solution. Less important trends were to downgrade the significance of the obstacle or state one's resignation to the legacy of past abuses. Proposed solutions generally involved improved management techniques and procedures and were considered the responsibility of the government to institute.

Cartoon Number Six suggested excluding people from forested areas as a precaution against forest fires. Subjects were strongly in agreement that there was no real problem involved. The dominant response involved demeaning the obstacle by stressing the importance of other causes of forest fires (mainly natural) and/or the beneficial effects that fire has on the forest environment. In many cases it was stated, either overtly or by implication, that the benefits accruing to the public as a result of forest access far exceeded any additional costs of preventing and suppressing forest fires. A subordinate response set encouraged government officials to step up efforts at educating the public to aid in forest fire prevention.

In Cartoon Number Seven a grazier has been informed that his herd has created an erosional hazard due to excessive soil compaction. No generally accepted concensus arose in this case. The reaction which occurred most frequently was to suggest some means of removing the obstacle through improved range management. The grazier was generally felt to be at fault although some debated that the actual cause of erosional hazard was the removal of vegetation. Most felt he should be held responsible for initiating improved techniques although government was frequently implicated as well. A fair number of responses either belittled or denied the problem.

Cartoon Number Twelve suggests that the failure to amalgamate transport and communication corridors causes the removal of enormous tracts of forested land from productive use. Reactions to this obstacle were in most cases less complex. The dominant inclination was toward resignation to the problem, frequently associated with the statement that it did not involve a great deal of land at any rate. A smaller proportion of solution-oriented respondents stressed the need for government to initiate some form of media consolidation. No blame for the problem was established.

The thirteenth cartoon bemoaned the aesthetically displeasing aspects of an area of recent timber harvest. Responses to this stimulus situation showed a strong degree of conformity. Answers generally objected that the aesthetic effect was as severe as suggested and many stressed the positive aspects of timber regeneration. A fair number of responses also suggested means of making the effects of cutting less objectionable. Solution-oriented responses were scarce, and only a few ventured to specify responsibility for the problem or its solution.

In Cartoon Number Fourteen, it is indicated that the deposits from a strip mining operation have completely smothered the bottom-life of a nearby stream. Most respondents felt that something could be done to ensure survival of both the mining operation and streambed, but specific solutions were scarce. The most prevalent recommendation was to hold the mining operation responsible for damages. Blame for the obstacle was for the most part placed on the mining operation while government was considered responsible for instituting a solution. A smaller number of cases were totally resigned to the problem or downgraded its magnitude.

In Cartoon Number Fifteen the source of frustration is a section of grazing fence which timber crews have apparently damaged. Respondents were highly critical of the timber crews, suggesting that they be held responsible for damages or that some means be initiated of avoiding such incidents in the future. Timber interests and government officials were held equally responsible for resolving the dilemma. A minor response set involved denigration of the obstacle.

Cartoon Number Sixteen portrayed an apologetic camper who had damaged the natural vegetation. Respondents consistently condemned the recreationist but were evenly split as to whether or not there was a solution to the problem. Those who stressed persistence usually held government responsible for better informing the public of the responsibilities attendant with the use of public recreation sites but a fair number also suggested holding the recreationist responsible for damages.

According to the instigator in Cartoon Number Seventeen, increased access and unfavorable public attitudes toward certain

wildlife is speeding the extinction of these species. Answers to the stimulus situation were rather diverse. The largest response type involved recommending the accomodation of all interests through reclamation of abandoned roads, better supervision of hunting activities and public education to recognize the value of all wildlife, or else in some way segregating the wildlife from roads and/or hunters. These solutions were held to be the responsibility of the government, whereas public attitudes were given somewhat more blame than access roads for the initial problem. A substantial number of respondents also denied the problem or denigrated its severity. A fair proportion were resigned to the obstacle.

Cartoon Number Nineteen is an objection to the potentially destructive effect of wildlife grazing on regenerating forests. It attracted more cases of obstacle denial than any other stimulus situation (17, or 26.6% of the sample). Another fifty-two percent of respondents denigrated the problem and/or felt resigned to it. The dominant feeling was that no one was to blame for the situation. Solution oriented answers played only a relatively minor role.

Taken together these twelve cartoons offer some valuable insights into the types of responses prevalent among Alberta Civil Servants. Prevailing reaction types, when taken within the context of the coding system as a whole, give some indication of potentially worthwhile approaches which remain to this point largely ignored. The extent to which respondents specified responsibility for obstacle and solution is worthy of scrutiny as well. If forested areas are going to accommodate increasing numbers of users it is essential that

clear lines of responsibility be established in the event of a conflict and, as such, any situations which stimulate divergent reactions warrant further study. Another perhaps more obvious implication, is the need to eliminate or at least minimize the number of "obstacle dominant" answers. The entire system of conflict resolution and resource management in general can profit by a broader understanding on the part of individual resource managers.

Frequency of Occurrence of Response Types By Professional Education

In comparing frequency of response types by professional education over the entire set of cartoons, it is not meant to uncover any functional relationships. It is only intended to indicate such tendencies as made themselves apparent within the constricted bounds of the sample.

Overall comparisons for the entire set of cartoons suggests that Agriculture Graduates, and particularly Foresters, are more likely to either downgrade or deny obstacles, while Biologists and particularly Geographers, tend to stress the positive aspects of the disturbing entity. (See Table 26.) Foresters were the only profession with a noticeably higher than (sample) average tendency to regard an obstacle as insurmountable. Foresters also established blame for the obstacle in a greater than average number of situations and tended to be less solution oriented. Geographers were considerably below average in establishing blame. Agriculture Graduates and Geographers both displayed a greater liking for solutions which resulted in conciliation and accommodation of all uses, as opposed to alternatives

Table 26 FREQUENCY OF OCCURRENCE OF RESPONSE TYPES
BY PROFESSIONAL EDUCATION FOR ALL CARTOONS

(expressed as aggregates and as percentages of the total sample)

| Profession Response Type | Agriculture | | Forestry | | Geography | | Biological Sciences | |
|--------------------------------|-------------|------|----------|------|-----------|------|------------------------|------|
| | # | % | # | % | # | % | # | % |
| ON(1) | 23 | 17.8 | 41 | 27.2 | 22 | 17.2 | 13 | 16.0 |
| ON(2) | 12 | 9.3 | 8 | 5.3 | 5 | 3.9 | 6 | 7.4 |
| ON(3) | 8 | 6.2 | 6 | 4.0 | 15 | 11.7 | 7 | 8.6 |
| ON(4) | - | - | 1 | .7 | - | - | - | - |
| ON(5) | 1 | .8 | 2 | 1.3 | - | - | 2 | 2.5 |
| Total ON | 44 | 34.1 | 58 | 38.4 | 42 | 32.8 | 28 | 34.6 |
| IntroP | 5 | 3.9 | 10 | 6.6 | 5 | 3.9 | 3½ | 4.3 |
| ExtraP(1) | 27½ | 21.3 | 31½ | 20.9 | 24 | 18.8 | 22½ | 27.8 |
| ExtraP(2) | 12½ | 9.7 | 14½ | 9.6 | 9 | 7.0 | 4 | 4.9 |
| ExtraP(3) | 1 | .8 | 7 | 4.6 | - | - | 2 | 2.5 |
| Imp | 6 | 4.7 | 5 | 3.3 | 3 | 2.3 | 1 | 1.2 |
| Total RO | 52 | 40.3 | 68 | 45.0 | 41 | 32.0 | 33 | 40.7 |
| OD | 33 | 25.6 | 60 | 39.7 | 37 | 28.9 | 13 | 16.0 |
| OD(1) | 10 | 7.8 | 13 | 8.6 | 10 | 7.8 | 8 | 9.9 |
| OD(2) | 2 | 1.6 | 2 | 1.3 | - | - | 4 | 4.9 |
| OD(3) | 2 | 1.6 | 3 | 2.0 | - | - | 1 | 1.2 |
| OD(4) | - | - | - | - | - | - | - | - |
| OD(5) | 3 | 2.3 | 3 | 2.0 | 2 | 1.6 | 2 | 2.5 |
| OD(6) | 1 | .8 | 2 | 1.3 | 8 | 6.3 | 9 | 11.1 |
| OD(7) | 4 | 3.1 | 2 | 1.3 | 1 | .8 | 1 | 1.2 |
| Total OD | 55 | 42.6 | 85 | 56.3 | 58 | 45.3 | 38 | 46.9 |
| IntroP | 38 | 29.5 | 27 | 17.9 | 42 | 32.8 | 17 | 21.0 |
| ExtraP(1) | 10 | 7.8 | 5 | 3.3 | 3 | 2.3 | 6 | 7.4 |
| ExtraP(2) | 2 | 1.6 | 2 | 1.3 | 1 | .8 | 1 | 1.2 |
| MultiP | 1 | .8 | 4 | 2.6 | 1 | .8 | 1 | 1.2 |
| Total RS | 51 | 39.5 | 42 | 27.8 | 47 | 36.7 | 25 | 30.9 |
| NP(S-1) | 13 | 10.1 | 18 | 11.9 | 8 | 6.3 | 8 | 9.9 |
| S-1 | 36 | 27.9 | 26 | 17.2 | 37 | 28.9 | 16 | 19.8 |
| S-2 | 3 | 2.3 | 3 | 2.0 | 1 | .8 | 2 | 2.5 |
| S-3 | 1 | .8 | 11 | 7.3 | 9 | 7.0 | 6 | 7.4 |
| S-3/1 | 1 | .8 | 1 | .7 | 6 | 4.7 | - | - |
| S-4 | 10 | 7.8 | 2 | 1.3 | 7 | 5.5 | 7 | 8.6 |
| Total NP | 64 | 49.6 | 61 | 40.4 | 68 | 53.1 | 39 | 48.1 |

which involved penalties or user exclusion. Next in order were Foresters, followed by Biologists with a roughly equal emphasis on each type of solution. Agriculturalists and Geographers established responsibility for initiating solutions somewhat more frequently than Foresters and Biologists.

When extending these types of distinctions to individual cartoons restricted sample sizes naturally dictate the need for greater caution in drawing conclusions. They are, however, more amenable to explanation. Tabular summaries of response types by individual cartoon are presented in Appendix D. The approach taken was to first distinguish those trends which were significantly different (in the statistical sense) from the sample norm and then attempt to relate them to professional affiliations.

For Cartoon Number One Foresters were less prone to feel resigned to the exclusion of timber operations in high altitude forests and more inclined to offer means of accommodating it without seriously damaging watershed values. They also were less inclined to deny the problem of recreationist-caused forest fires.

Whenever the primary interests of Foresters and Agriculturalists were juxtaposed, professional biases emerged quite clearly. In Cartoon Number Fifteen, Foresters were more likely to downgrade the problem of timber crews causing damage to grazing fences and were the only ones to deny the problem altogether. They had the least tendency to blame timber crews and the greatest number of suggestions that perhaps some other party was at fault. Agriculturalists, by comparison, blamed the timber crews more than any other group.

In Cartoon Number Four, where graziers are blamed for having incurred additional costs to timber operators, Agriculturalists take a defensive position. They deny the problem to a greater extent and are the only ones to describe it in favorable terms. They show the least tendency to blame graziers and the only cases in which either the timber crew is blamed or no blame is affixed whatsoever. Finally, Agriculturalists alone ignored the possibility of excluding graziers from the area.

In Cartoon Number Seven, Agriculturalists are far more oriented towards solving the erosional problem than the other professions. Solutions offered are all of the conciliatory variety seeking to accommodate the grazer through improved grazing techniques. The only answers which demanded removal of grazing came from Foresters. No Agriculturalists were resigned to the situation, whereas the other three groups registered between thirty-five and forty-five percent incidence of this type of reaction.

The responses of Agriculturalists appear to reflect the consequence of considering problems far removed from the area central to their competence. In Cartoons Number Seventeen and Nineteen, both of which involved wildlife, Agriculture Graduates showed the greatest tendency to either describe the obstacle in impunitive terms or else abstain from fixing any blame at all.

The differences in attitude between Agriculturalists and Fish and Wildlife Biologists were noticeable in Cartoons Number Twelve and Sixteen. While Biologists showed a greater than average resignation to the problem of dispersed transport and communication

links, Agriculturalists were very solution-oriented. Also, as regards recreational damage of camping sites, Biologists showed the greatest inclination to blame the camper and Agriculturalists, the least. These observations could be interpreted as relating to the Agriculturalist's greater degree of association and feeling of competence in matters relating to man-altered landscapes and the human presence. A comparable effect with Biologists arose in Cartoon Number Fourteen where they were noticeably less inclined to deny the deleterious effect of strip mining deposits on the bottom life of streams, and also most frequently suggested a solution.

Response tendencies which were found unexplainable or contrary to expectations consumed all of two cartoons and portions of four others. In Cartoon Number Nineteen which postulates that wildlife grazing takes a heavy toll on regenerating forests, Biologists and Foresters were particularly accommodating of each others major interest. Foresters had the most tendency to deny the severity of the problem and Biologists the least. Foresters also had the highest levels of resignation to the obstacle and were the only ones to shift the blame to other causes. The results appear to suggest that these two groups have gravitated to a position of mutual understanding and acceptance of the others values. If this is so it may be the long term result of the close association of the two groups within the same department.

Other reactions of dubious explanation include the lack of persistent answers by Foresters to the problem of recreational damage to natural vegetation. This could be interpreted to indicate that

although Foresters have learned to consider recreational values, they as yet lack the understanding to actually handle the human element. Also, Agriculturalists were less frequent to deny that aesthetically displeasing areas of timber harvest were a problem. This is perhaps a reflection of the remoteness of the problem from their immediate area of competence. Biologists tended more to deny the problem of grazing fences damaged by timber crews and in addition to Geographers, were more solution-oriented in responding to the problem of poorly-planned access roads. Geographers also accorded the problem of disappearing wildlife species significantly more recognition.

Of the entire set of twelve cartoons professional attributes can be used to explain all the variations in six cartoons and a portion of the variations in four others. Differentials in response were most noticeable whenever the prime interest of one or more professional groups were involved. Distinctions were reasonably clear between Agriculturalists and Foresters and Biologists. Biologists and Foresters seem to have come to a mutual understanding, while the response variations of Geographers tended to be random and uncomprehensible. This latter fact may indicate that the measurement instrument was improperly designed to measure the attitudinal tendencies of Geographers, or could simply reflect the inability of the author to recognize them due to his own professional bias. On the positive side it could also imply that the varying backgrounds of Geographers produce a lesser level of homogeneity.

Frequency of Occurrence of Response Types By Agency

Overall comparisons for the entire set of cartoons suggest that Provincial Planning is most divergent from the sample average in its response tendencies. The inclinations of its sampled members

were consistently lower than average for obstacle negation, obstacle dominance and responsibility for the obstacle. On the other hand, it ranked noticeably higher than average for persistent reactions and fixing responsibility for solutions. Similarly, Lands Division ranked lower than normal for obstacle dominance and above average for persistence and indicating responsibility for solution. Inter-departmental Planning ranked lower than average for obstacle negation.

By contrast, the Environment Conservation Authority ranked higher on obstacle negation and lower for solutions and responsibility therefore. Finally, Fish and Wildlife was below average in allocating blame. Once again, these findings are proffered only as trends. Any attempts at explanation are foregone because of the variety of different stimulus situations which gave rise to these results.

When making comparisons by individual cartoons, it must be kept in mind that sample sizes are extremely small to be compared over such a large number of response categories. This naturally results in a substantial amount of random variation and underlines the need to be selective in delineating trends. The danger of subjectivity rises accordingly. Tabular summaries of response types by individual cartoons are presented in Appendix E.

Analysis by individual cartoon proved considerably less rewarding than previously with professional groups. The results were first analyzed to delineate any outstanding values or groups of values. This approach proved relatively fruitless, producing conclusive trends in only two cartoons. It was reasoned that this approach, while consistent with that taken in the analysis by profession, was insufficient in this instance due to the difficulty of distinguishing

trends when comparing such a large number of groups. The results from each cartoon were further analyzed by comparing the scoring tendencies of those agencies deemed to be most directly involved in the cartoon situation.

This second approach served to indicate a number of other expected trends, but failed to approach the degree of success enjoyed with professional groups. The results of Cartoon Number One clearly supported the hypothesized correlation between the major concern of the agency and response tendencies. Respondents from Water Resources were most consistent in recognizing the problem of headwater protection while Timber Management was at exactly the opposite extreme. Timber Management personnel were also more inclined to suggest a solution which would accommodate timber operators without damaging watershed values.

Cartoon Number Four similarly supported the hypothesis. Lands Division were more prone to deny that graziers could incur any extra costs to timber operators and tended to a considerable degree to be resigned to the obstacle despite an overall tendency strongly in the reverse direction. (See Table 26.) Lands also offered the only impunitive type reactions as well as shifting the blame to the timber operator in one instance.

Responses to Cartoon Number Twelve were reasonably as might have been predicted. The Forest Land Use Branch was more prone to deny the problem of unconsolidated transport and communication links but also ranked high in proposing solutions to what problem there was. Cartoon Number Thirteen indicated a difference of outlook between the

Table 27 FREQUENCY OF OCCURRENCE OF RESPONSE TYPES
BY GOVERNMENT AGENCY FOR ALL CARTOONS

(expressed as percentages of total sample with sample size in brackets)

| Agency Response Type | TM (81) | FLU (45) | MLU (84) | Lands (71) | F&W (78) | Parks (79) | IPD (59) | WR (56) | ECA (34) | PP (59) | SCAC (48) | LUAC (106) |
|----------------------------|------------|-------------|-------------|---------------|-------------|---------------|-------------|------------|-------------|------------|--------------|---------------|
| ON(1) | 28.4 | 22.1 | 22.6 | 21.1 | 17.9 | 13.9 | 18.6 | 19.6 | 23.5 | 13.6 | 18.7 | 19.8 |
| ON(2) | 2.4 | 11.5 | 4.7 | 7.0 | 5.1 | 16.4 | 3.3 | 7.1 | 17.6 | 3.3 | 14.5 | 5.6 |
| ON(3) | 4.9 | 3.1 | 10.7 | 8.4 | 3.8 | 3.7 | 3.3 | 12.5 | 2.9 | 1.6 | 4.1 | 5.6 |
| ON(4) | 1.2 | | | | | | | | | | | |
| ON(5) | 1.2 | | 2.3 | 1.4 | 2.5 | | | | 2.9 | | 2.0 | .9 |
| Total ON | 38.3 | 36.8 | 40.4 | 38.0 | 29.4 | 34.1 | 25.4 | 39.2 | 47.0 | 18.6 | 39.5 | 32.0 |
| OD | 46.9 | 24.2 | 41.6 | 15.4 | 24.3 | 29.1 | 32.2 | 33.9 | 44.1 | 18.6 | 22.9 | 32.0 |
| OD(1) | 7.4 | 11.5 | 8.3 | 4.2 | 11.5 | 7.5 | 10.1 | 8.9 | | 8.4 | 10.4 | 6.6 |
| OD(2) | 1.2 | 4.2 | | 1.4 | 1.2 | 3.7 | 1.6 | | 5.8 | | 4.1 | .9 |
| OD(3) | | 1.0 | | 1.4 | 1.2 | | 3.3 | | | | 2.0 | 1.8 |
| OD(4) | | 1.0 | | 1.4 | | | | 1.7 | | | 2.0 | .9 |
| OD(5) | | 4.2 | 1.1 | 1.4 | 3.8 | 3.7 | | 5.3 | | | 4.1 | 3.7 |
| OD(6) | 2.4 | 2.1 | 3.5 | | 10.2 | 7.5 | | 5.3 | | 6.8 | 2.0 | .9 |
| OD(7) | 1.2 | 1.0 | 2.3 | 4.2 | 2.5 | | 3.3 | 1.7 | | | | 3.7 |
| Total OD | 59.2 | 49.4 | 57.1 | 29.5 | 55.1 | 51.8 | 55.9 | 57.1 | 50.0 | 33.9 | 47.9 | 50.9 |
| NP(S-1) | 14.8 | 8.4 | 5.9 | 11.2 | 5.1 | 10.1 | 8.4 | 5.3 | 5.8 | 10.1 | 14.5 | 11.3 |
| S-1 | 14.8 | 24.2 | 21.4 | 36.6 | 26.9 | 15.1 | 16.9 | 19.6 | 11.7 | 42.4 | 16.6 | 20.7 |
| S-2 | 1.2 | 3.1 | 3.5 | 1.4 | | | | 1.7 | | | | .9 |
| S-3 | 4.9 | 5.2 | 10.7 | 2.8 | 3.8 | 7.5 | 1.6 | 5.3 | 8.8 | 8.4 | 4.1 | .9 |
| S-3/1 | 1.2 | 1.0 | 3.5 | 1.4 | | | | | 2.9 | 5.0 | | .9 |
| S-4 | 2.4 | 4.2 | 3.5 | 7.0 | 7.6 | 6.3 | 11.8 | 5.3 | | 10.1 | 10.4 | 7.5 |
| Total NP | 39.5 | 46.3 | 48.8 | 60.5 | 43.5 | 39.2 | 38.9 | 37.5 | 29.4 | 76.3 | 45.8 | 42.4 |

..... continued

| Agency Response Type | | TM (81) | FLU (45) | MLU (84) | Lands (71) | F&W (78) | Parks (79) | IPD (59) | WR (56) | ECA (34) | PP (59) | SCAC (48) | LUAC (106) |
|----------------------------|--|------------|-------------|-------------|---------------|-------------|---------------|-------------|------------|-------------|------------|--------------|---------------|
| IntroP | | 6.2 | 5.2 | 5.9 | 5.6 | 1.2 | 2.5 | 5.0 | 4.5 | 7.3 | 1.6 | 9.3 | 3.7 |
| ExtraP(1) | | 22.8 | 21.0 | 27.3 | 16.9 | 19.8 | 20.8 | 27.1 | 17.8 | 26.4 | 13.6 | 28.1 | 22.1 |
| ExtraP(2) | | 10.5 | 5.2 | 10.1 | 11.2 | 3.2 | 5.6 | 10.1 | 14.2 | 7.3 | 8.4 | 7.2 | 4.2 |
| ExtraP(3) | | 3.7 | 2.1 | .5 | 2.8 | 1.2 | 2.5 | | | | | 2.0 | 1.8 |
| Imp | | 1.2 | 7.3 | | 4.2 | | 3.7 | 3.3 | 5.3 | 2.9 | 1.6 | 2.0 | 4.7 |
| Total RO | | 44.4 | 41.0 | 44.0 | 40.8 | 25.6 | 35.4 | 45.7 | 41.9 | 44.1 | 25.4 | 48.9 | 36.7 |
| IntroP | | 13.5 | 25.2 | 22.6 | 38.0 | 21.7 | 13.9 | 20.3 | 17.8 | 11.7 | 54.2 | 18.7 | 19.8 |
| ExtraP(1) | | 3.7 | 2.1 | 3.5 | 4.2 | 5.1 | 7.5 | 8.4 | 7.1 | 2.9 | 1.6 | 8.3 | 6.6 |
| ExtraP(2) | | 1.2 | | 2.3 | 2.8 | | | 1.6 | | | | | |
| MultiP | | 3.7 | 2.1 | | 4.2 | 1.2 | 2.5 | | | | 3.3 | | |
| Total RS | | 22.2 | 29.4 | 28.5 | 49.2 | 28.2 | 24.0 | 30.5 | 25.0 | 14.7 | 59.3 | 27.0 | 26.4 |

Key: TM - Timber Management Branch
 FLU - Forest Land Use Branch
 MLU - Multiple Land Use Section
 F&W - Fish and Wildlife Division
 IPD - Interdepartmental Planning Division
 WR - Water Resources Division
 ECA - Environment Conservation Authority
 PP - Provincial Planning Branch
 SCAC - Strip Coal Advisory Committee
 LUAC - Land Use Assignment Committee

Parks and Timber Management divisions. While Parks exhibited the greatest tendency to acknowledge the problem and provide a solution, Timber Management reacted in much the opposite manner. Parks were also the only agency to suggest exclusion of timber operations in the area involved. The proposed hypothesis explained portions of the responses of six additional cartoons, while the remaining two provided no supportive evidence whatsoever.

This low level of confirmation for the effects of agency affiliation can be only partially explained as a result of small and numerous sample groupings. However, this problem should have been largely overcome through the isolation of particular groups relevant to the analysis. The author must conclude that agency affiliation does not in fact play a major role in shaping the attitudes of public resource managers. The only instances in which the hypothesis was supported was where an overlap between agency and profession occurred. If agency affiliation does play a conditioning role it must be assumed to be relatively minor in importance perhaps entailing merely a modification of professional attitudes. The negation of this hypothesis also brings to light the question whether a more individualistic identification of occupations (as opposed to agency affiliations) might have revealed more meaningful correlations.

Frequency of Occurrence of Response Types By Age Groups

Table 27 consists of a breakdown of response trends in accordance with the age groups established earlier in this chapter. A number of trends can be observed in the data. The oldest age grouping

Table

28 FREQUENCY OF OCCURRENCE OF RESPONSE TYPES BY AGE GROUPS

(expressed as aggregates and as percentages of the total sample)

| Response Type | Age Group | | Age: 24-31 | | Age: 32-39 | | Age: 40-47 | | Age: 48-55 | |
|------------------|--------------|------|------------|------|------------|------|------------|------|------------|---|
| | # | % | # | % | # | % | # | % | # | % |
| ON(1) | 56 | 19.0 | 34 | 22.8 | 28 | 18.5 | 32 | 22.5 | | |
| ON(2) | 13 | 4.4 | 8 | 5.4 | 12 | 7.9 | 24 | 16.9 | | |
| ON(3) | 29 | 9.9 | 7 | 4.7 | 6 | 4.0 | 4 | 2.8 | | |
| ON(4) | | | | | | | 1 | .7 | | |
| ON(5) | 3 | 1.0 | 2 | 1.3 | 1 | .7 | 1 | .7 | | |
| Total ON | 101 | 34.4 | 51 | 24.2 | 47 | 31.1 | 62 | 43.7 | | |
| IntroP | 16 | 5.4 | 3 | 2.0 | 8 | 5.3 | 8 | 5.6 | | |
| ExtraP(1) | 62 | 21.0 | 35 | 23.5 | 31 | 20.5 | 29 | 20.4 | | |
| ExtraP(2) | 22 | 7.5 | 8 | 5.4 | 8 | 5.3 | 16 | 11.3 | | |
| ExtraP(3) | 2 | .7 | 5 | 3.4 | 2 | 1.3 | 4 | 2.8 | | |
| Imp | 3 | 1.0 | 5 | 3.4 | 10 | 6.6 | 8 | 5.6 | | |
| Total RO | 105 | 35.7 | 56 | 37.6 | 59 | 39.1 | 65 | 45.8 | | |
| OD | 89 | 30.2 | 53 | 35.6 | 39 | 25.8 | 35 | 24.6 | | |
| OD(1) | 25 | 8.5 | 11 | 7.4 | 15 | 9.9 | 9 | 6.3 | | |
| OD(2) | 7 | 2.4 | 1 | .7 | 3 | 2.0 | 4 | 2.8 | | |
| OD(3) | 1 | .3 | 1 | .7 | 3 | 2.0 | 4 | 2.8 | | |
| OD(4) | | | | | 1 | .7 | 2 | 1.4 | | |
| OD(5) | 7 | 2.4 | 4 | 2.7 | 3 | 2.0 | 4 | 2.8 | | |
| OD(6) | 17 | 5.8 | 6 | 3.0 | 2 | 1.3 | 1 | .7 | | |
| OD(7) | 6 | 2.0 | 2 | 1.3 | 3 | 2.0 | 2 | 1.4 | | |
| Total OD | 152 | 51.7 | 78 | 52.3 | 69 | 45.7 | 61 | 43.0 | | |
| IntroP | 59 | 20.1 | 34 | 22.8 | 36 | 23.8 | 36 | 25.4 | | |
| ExtraP(1) | 7 | 2.4 | 5 | 3.4 | 8 | 5.3 | 7 | 4.9 | | |
| ExtraP(2) | 3 | 1.0 | 1 | .7 | 2 | 1.3 | 1 | .7 | | |
| Total RS | 69 | 23.5 | 40 | 26.8 | 46 | 30.5 | 44 | 31.0 | | |
| NP(S-1) | 25 | 8.5 | 13 | 8.7 | 16 | 10.6 | 15 | 10.6 | | |
| S-1 | 62 | 21.1 | 32 | 21.5 | 37 | 24.5 | 36 | 25.4 | | |
| S-2 | 2 | .7 | 3 | 2.0 | 2 | 1.3 | 2 | 1.4 | | |
| S-3 | 18 | 6.1 | 8 | 5.4 | 7 | 4.6 | 5 | 3.5 | | |
| S-3/1 | 6 | 2.0 | 1 | .7 | 1.7 | .7 | 2 | 1.4 | | |
| S-4 | 16 | 5.4 | 9 | 6.0 | 9 | 6.0 | 7 | 4.9 | | |
| Total NP | 129 | 43.9 | 66 | 44.3 | 72 | 47.7 | 67 | 47.2 | | |

held considerably more obstacle negation; with a response rate of 43.7 percent as compared to the frequency rating of younger age groups which ranged from 31.1 to 34.4 percent. This would be consistent with Sewell's contention that more experienced individuals tend to be less inclined to recognize any new problems which threaten to upset the established order.³ Trends which occurred within the general category of obstacle negation included gradual increases in obstacle denial with increasing age which was to some degree offset by decreases in responses which stressed the positive aspects of obstacles.

Other variations include increasing designation of blame with age (with values increasing from 35.7 to 45.8 percent), underlain by an internal trend towards impunitive reactions. There seems to be a trade-off from obstacle dominance to needs persistence with greater age, associated with a decreasing tendency to buttress indicated obstructions by elaborating on the problems they present. Older respondents showed a greater tendency to indicate who was responsible for initiating solutions and tended to shift away from the type of conflict resolution which involved user exclusion to a greater emphasis on the accommodation of all parties concerned.

In summary, it seems that increasing experience tends to be accompanied by a growing desire to deny obstacles and ignore the positive aspects of obstructive situations. On the positive side, increasing age also facilitates an improved ability to recommend solutions which accommodate all interests, as well as delineating responsibility for obstacles and their solution.

Frequency of Response Type By Outdoor Recreation Participation

Response tendencies for Cartoons Thirteen and Seventeen (both of which involved recreational considerations) were further analyzed in accordance with outdoor recreation participation. (See Table 28.)

Response frequencies for Cartoon Number Thirteen were tabulated according to the three groups of recreationists established earlier in the chapter. Results showed only a few trends which extended through all these categories. The only one of meaningful value was a decrease in obstacle denial with increased participation in outdoor recreation. Presumably the more one participates the greater is one's familiarity with conflict situations arising with other users, and perhaps the more demanding are one's expectations relative to the aesthetic quality of recreational surroundings.

Cartoon Number Seventeen was dissected so as to compare the reactions of hunters and fishermen with those of other respondents. Results showed one major distinction which accounted for all major variations in response types. The tendency towards obstacle negation among hunters and fishermen was almost double that of the remainder of the sample. Particularly notable was the fact that the proportion of hunters and fishermen who absolutely denied the existence of such a problem was nine times greater than that of others.

It seems that the outside interests of resource managers can potentially have a considerable effect on their appraisal of matters relating thereto, particularly when couched in implications which are specific to the individual.

Table FREQUENCY OF OCCURRENCE OF RESPONSE TYPES FOR CARTOON NO. 13
29 BY OUTDOOR RECREATION SCORE AND FOR CARTOON NO. 17 BY
 PARTICIPATION IN HUNTING AND FISHING

(expressed as percentages of total sample with sample size indicated in brackets)

| | CARTOON NO. 13 | | | CARTOON NO. 17 | |
|-----------|-------------------------|-------------------------|------------------------|--------------------------------|----------------|
| | OR Score 1-3 (19) | OR Score 4-6 (23) | OR Score 7+ (10) | Hunters & Fishermen (27) | Others (36) |
| ON(1) | 52.6 | 69.6 | 50.0 | 7.4 | 13.9 |
| ON(2) | 10.5 | 4.3 | | 25.9 | 2.8 |
| ON(3) | 15.8 | 30.4 | 30.0 | | 2.8 |
| ON(4) | | | | | |
| ON(5) | | | | | |
| Total ON | 78.9 | 104.3 | 80.0 | 33.3 | 19.5 |
| IntroP | 5.3 | 4.3 | | | 8.3 |
| ExtraP(1) | 5.3 | | | 11.1 | 5.6 |
| ExtraP(2) | 5.3 | | | 11.1 | 22.2 |
| ExtraP(3) | | | | | 5.6 |
| Imp | | | | | |
| Total RO | 15.8 | 4.3 | - | 22.2 | 41.7 |
| OD | 26.3 | 43.5 | 30.0 | 25.9 | 33.3 |
| OD(1) | 5.3 | 8.7 | 10.0 | | |
| OD(2) | 5.3 | 4.3 | 20.0 | 7.4 | |
| OD(3) | 5.3 | | 10.0 | | |
| OD(4) | | | | | |
| OD(5) | | | | | |
| OD(6) | | 4.3 | | 3.7 | 2.8 |
| OD(7) | | | | | |
| Total OD | 68.4 | 69.5 | 80.0 | 37.0 | 36.1 |
| IntroP | 5.3 | | | 40.7 | 55.6 |
| ExtraP(1) | | | 10.0 | | |
| ExtraP(2) | | | | | |
| MultiP | | | | | |
| Total RS | 5.3 | - | 10.0 | 40.7 | 55.6 |
| NP(S-1) | | 4.3 | | 3.7 | 8.3 |
| S-1 | 15.8 | | 10.0 | 22.2 | 33.3 |
| S-2 | | | | | |
| S-3 | 5.3 | | | 18.5 | 22.2 |
| S-3/1 | 5.3 | | | | |
| S-4 | | | | | |
| Total NP | 26.3 | 4.3 | 10.0 | 44.4 | 63.8 |

Homogeneity of Response Types Within Agencies and Professional Groups

The measure of homogeneity employed here had originally been intended to compare the standardizing effects of professional and vocational groupings. The measure is necessarily crude (as was explained in the preceding chapter) and this fact is reflected in the somewhat contradictory results which it produced. (See Tables 29 and 30.) Thus for the sake of comparing average homogeneity of response within agencies and professions, it seems more advisable to rely upon the results of the preceding analysis by individual cartoons.

However, by removing one degree of generality it may be justifiable to employ these figures in a comparative ordering of measured and perceived homogeneity. The arrangement of these sequences in Table 31 reveals little correlation between measured and perceived values, with the exceptions of Lands, Interdepartmental Planning, and Fish and Wildlife. It is quite conceivable, however, that these three are just chance correlations. The hypothesized overall lack of consistency is, at any rate, vindicated.

Table 30 HOMOGENEITY OF RESPONSE WITHIN
AGENCIES FOR EACH CARTOON

(expressed as percentage of responses occurring in dominant reaction type)

| | <u>TM</u> | <u>FLU</u> | <u>MLU</u> | <u>Lands</u> | <u>F&W</u> | <u>Parks</u> | <u>IDP</u> | <u>WR</u> | <u>PP</u> |
|----------------|-----------|------------|------------|--------------|----------------|--------------|------------|-----------|-----------|
| <u>Cartoon</u> | | | | | | | | | |
| No. 1 | 41.7 | 72.7 | 40.0 | 60.0 | 77.8 | 63.7 | 100.0 | 71.4 | 85.7 |
| No. 4 | 57.1 | 55.6 | 55.6 | 42.8 | 71.4 | 37.5 | 57.1 | 42.9 | 71.4 |
| No. 5 | 75.0 | 55.6 | 38.9 | 50.0 | 62.5 | 37.5 | 71.4 | 42.9 | 55.6 |
| No. 6 | 41.7 | 41.7 | 61.6 | 53.9 | 66.7 | 50.0 | 50.0 | 85.7 | 50.0 |
| No. 7 | 50.0 | 45.5 | 50.0 | 66.7 | 57.2 | 57.2 | 80.0 | 60.0 | 66.7 |
| No. 12 | 62.5 | 45.0 | 62.5 | 57.2 | 66.7 | 50.0 | 80.0 | 85.7 | 66.7 |
| No. 13 | 61.6 | 50.0 | 56.3 | 50.0 | 44.5 | 46.7 | 62.5 | 66.7 | 42.9 |
| No. 14 | 44.4 | 36.4 | 62.5 | 62.5 | 50.0 | 71.4 | 60.0 | 50.0 | 100.0 |
| No. 15 | 57.2 | 44.4 | 55.6 | 71.4 | 50.0 | 66.6 | 100.0 | 50.0 | 75.0 |
| No. 16 | 71.4 | 80.0 | 57.1 | 66.7 | 71.4 | 62.5 | 60.0 | 50.0 | 75.0 |
| No. 17 | 33.3 | 41.7 | 83.3 | 62.5 | 60.0 | 37.5 | 60.0 | 50.0 | 100.0 |
| No. 19 | 45.4 | 60.0 | 47.6 | 50.0 | 44.4 | 71.4 | 40.0 | 66.7 | 50.0 |
| <u>Average</u> | 53.4 | 52.4 | 55.9 | 57.8 | 60.2 | 54.3 | 68.4 | 60.2 | 69.9 |

Average Homogeneity of Response With Agencies - 59.2

Table 32 HOMOGENEITY OF RESPONSE WITHIN
PROFESSIONAL GROUPS FOR EACH CARTOON

| | <u>Agriculture</u> | <u>Forestry</u> | <u>Geography</u> | <u>Biological Sciences</u> |
|----------------|--------------------|-----------------|------------------|--------------------------------|
| <u>Cartoon</u> | | | | |
| No. 1 | 57.1 | 42.9 | 69.2 | 62.5 |
| No. 4 | 46.1 | 53.8 | 60.0 | 71.7 |
| No. 5 | 53.8 | 66.6 | 58.3 | 71.4 |
| No. 6 | 45.8 | 45.4 | 63.1 | 70.0 |
| No. 7 | 90.9 | 46.6 | 50.0 | 42.9 |
| No. 12 | 45.4 | 55.5 | 58.4 | 70.0 |
| No. 13 | 56.2 | 60.0 | 60.0 | 50.0 |
| No. 14 | 66.6 | 50.4 | 54.5 | 81.8 |
| No. 15 | 66.6 | 46.4 | 60.0 | 50.0 |
| No. 16 | 66.6 | 61.5 | 76.9 | 55.6 |
| No. 17 | 54.5 | 38.9 | 66.6 | 55.6 |
| No. 19 | 38.5 | 50.0 | 40.0 | 55.6 |
| <u>Average</u> | 57.3 | 51.5 | 59.7 | 61.4 |

Average Homogeneity of Response Within Professional Groups - 57.5

REFERENCES AND FOOTNOTES

- 1 Theoretically possible range of average scores within the constraints of individual sample scores.

- 2 See for instance: George R. Hall, "The Myth and Reality of Multiple Use Forestry", Natural Resources Journal (1963), Vol. 3, pp. 276-290; R.W. Behan, "The Succotash Syndrome, or Multiple Use: A Heartfelt Approach to Forest Land Management", Natural Resources Journal (1967), Vol. 7, pp. 473-484; Philip L. Martin, "Conflict Resolution Through The Multiple Use Concept in Forest Service Decision-Making", Natural Resources Journal (1969), Vol. 9, pp. 228-236; R.S. Whaley, "Multiple Use Decision-Making - Where Do We Go From Here?", Natural Resources Journal, Vol. 10, pp. 557-565; Warren A. Starr, "Multiple Use Land Management"; Natural Resources Journal (1961), Vol. 1, pp. 288-301; Kenneth P. Davis, "What Multiple Forest Land Use and For Whom?", Journal of Forestry, Vol. 67, pp. 719-721; A.W. Greeley and L.P. Neff, "Forestry Decisions In The Light of Multiple Products (A Case Study)", Journal of Forestry (1968), Vol. 66, pp. 788-791.

- 3 R.W.D. Sewell, "Environmental Perceptions and Attitudes of Engineers and Public Health Officials", Environment and Behaviour (1971), Vol. 3, No. 1, p. 44.

CHAPTER VI

SUMMARY, CONCLUSIONS AND APPLICATIONS

SUMMARY

Research to date has indicated that professional, institutional and biographical factors have a considerable effect on the decision-making patterns of the resource manager. In a variety of ways these factors affect the decision-maker's interpretation of the problem, his perception and choice of alternate means and his preferences for outcome.

This study is designed to extend this line of research into the field of forest land use management. The sample group is both professionally and institutionally diverse but originates from a fairly integrated decision-making system. Stimulus material was standardized through a projective technique. This approach held the advantage of exposing the respondents to a greater variety of stimulus material, thus making it possible to include institutional groups of somewhat divergent responsibilities. Standardization was also more conducive to delineation of systematic variations, a necessary condition in light of the degree of interaction between the sample groups being compared.

The Alberta Civil Servant involved in forest land management was deemed a suitable subject for the investigation of this problem for a number of reasons. Firstly, the authority for the management of forested lands in the province is diffused through a number of integrated management and planning agencies. Secondly, the management of forested lands in Alberta has emerged from an era of single use orientations and is presently undergoing a renovation of policies and procedures in order to successfully accommodate a wider range of users. Thirdly, Alberta's forested lands are virtually

all crown-owned, and its managers, because they are responsible to the public, are naturally prone to a full range of social and economic demands that private managers would rarely, if ever, experience.

The major hypothesis of the research was that the ways in which public forest resource managers, planners and advisors perceive forest management problems and their solutions are reflections of professional, institutional and biographical factors. A number of subordinate hypotheses were also tested. These were concerned with:

- 1) the relative importance of professional and institutional factors,
- 2) the effect of overlapping between professional and institutional groups,
- 3) variation in the definition of forest management terms,
- 4) the relationship between problem perception and work emphasis,
- and 5) the degree of agreement between perceived levels of attitudinal conformity and measured levels.

The results of data analysis varied from supporting, to equivocal, to non-supporting with respect to the proposed hypotheses. Analysis also yielded some interesting facts of a more descriptive nature.

Questions relating to biographical attributes of the respondents revealed that respondents were characteristically quite young, had held their current position only a short period of time and had not held a position relating to another field of forest resource management. Post secondary educational training varied considerably, but Forestry, Agriculture, Geography and the Biological Sciences together accounted for two-thirds of the stated affiliations.

In terms of degree of dependence on professional ties to provide reading material and memberships, Biologists showed the greatest degree of dependence, followed in order by Agriculturalists, Foresters

and Geographers. The overall average of dependency ratios and the degree of variation among these professional groups were both greater for memberships than for reading habits. The proportion of respondents from a particular agency who were the type of professional that was most numerous in that agency therein varied from .29 to 1.00 and averaged .67.

Respondents generally felt that work content had been the most important item guiding them to their present position, and that on-the-job training had proven of considerably greater value to them than their education.

In answer to the request to list the major problems faced by Albertans today, sixty-five percent of respondents listed at least one problem which related directly to forest land management. Forty-four percent of all responses related thereto. A specific ranking of forest management problems revealed that two-thirds of the respondents felt them to be "important" or "very important". A reasonably clear direct relationship emerged between degree of concern for such problems and extent of involvement with them.

Seven-eighths of all respondents felt that an increasing concern over forest land use conflicts was justified. Increasing demands and inadequacies of present and past management were the major reasons given to justify this increasing concern. Definitions of "forest land use conflict" revealed a lack of concensus and the multidimensional nature of the concept. Respondents reported a reliance on four major sources of awareness for delineating conflicts: complaints from the public, from within the department, from other departments, and from personal observations. Environmental and economic criteria were cited

as being most important in the resolution of forest management problems, but choosing them did not seem to relate to any preconceived ordering of values.

Opinions as to the definition of "multiple use" were also diverse. Respondents tended to agree that the concept was at least of "considerable worth", but were largely indecisive as to the degree of success with which it had been applied in Alberta. A wide variety of barriers to such a successful application were mentioned. It was generally felt that considerable similarity of attitudes and opinions existed between the members of particular management agencies. The variation in this perceived homogeneity was rather small from one agency to another.

Overall summaries of response types in each cartoon of the picture frustration test provided some insight into the varying approaches Alberta Civil Servants take to particular problems. Three stimulus situations produced a dominant tendency to deny the importance of the problem: 1) recreationists were not considered a major cause of forest fires, 2) wildlife grazing was not deemed to have a particularly detrimental effect on forest regeneration, and 3) the aesthetic depreciation afforded by timber harvest was not perceived as being particularly serious. Respondents were generally resigned to the separation of communication and transportation links and felt that the exclusion of timber operations from high altitude forests was warranted.

Subjects were reasonably consistent in condemning the grazier for the bother he caused timber operators and his negligence in creating an erosional hazard, the timber operator for damaging grazing

fences, the mining operator for smothering the bottom life of a nearby stream, and the camper for his damage to the vegetation of a recreational site. The balance of the response tendencies associated with these situations varied however. Timber crews and graziers were considered deserving of being held responsible for the detrimental effects they had on each other. In the case of the grazier, exclusion from the use of the land in question was also suggested. About half the respondents were resigned to the damages caused by recreationists in camping areas but those who were not suggested either improved public education or fines. The grazier was held primarily responsible for elimination of the erosional hazard through improved management practices. Few offered specific solutions for the stream that had been polluted by mining wastes.

Two situations stimulated a wide variety of response trends. Slightly over half the answers to the accusation that oil firms were extravagant with forested land when clearing access routes indicated a resignation to the obstacle. Most of the remainder were solution-oriented and implicated both the oil firms and relevant government agencies in improved planning for such development. Response trends for the problem of discriminatory hunting practices were similarly divergent. About half the respondents either denied the problem or were resigned to it. The other half, who stressed solutions, were divided between those who stressed better management practices, and those who suggested that threatened game be separated from roads and/or hunters. Blame for the problem was accorded mostly to hunters but also the fact that the roads which afforded them access were open to the public.

Frequency of response types by professional education when summarized for all cartoons revealed some interesting trends. Foresters showed the greatest degree of variance from the sample norm. They displayed greater willingness to downgrade an obstacle or resign themselves to it, and also established blame for the obstacle in a greater than average number of instances. They were also less inclined to suggest solutions, particularly those which involved conciliation of all uses. Agriculturalists were more likely to deny or denigrate obstacles, more likely to establish responsibility for solutions, and seemed to prefer the type of solution that resulted in conciliation and accommodation of all uses, as opposed to those which involved penalties or user exclusion.

Geographers tended more to stress the positive aspects of disturbing entities, were considerably below average in establishing blame, and displayed a greater liking for conciliatory solutions. They also had a slightly greater than average tendency to establish responsibility for initiating solutions. Biologists were more prone to stress the positive aspects of disturbing entity and less inclined to establish responsibility for initiating solutions.

When these variations were broken down by individual cartoons, professional affiliations were offered as explanations for six cartoons complete and portions of four others. Factors found useful in explaining differences in response trends include: 1) a defensive position taken relative to the use with which professional groups are most involved/associated, 2) an accompanying antagonism toward any user group which implicates that dominant concern in an unfavourable light, and 3) the degree of removal that stimulus situations were from

the realm of familiar experience. Response differentials were most noticeable whenever the prime interests of one or more professional groups were involved.

A comparable breakdown of response types by individual agencies revealed a far lesser number of meaningful relationships. Those variations which were interpretable were mostly attributable to overlaps with professional groupings. These findings could relate partially to the fact that groups were smaller and hence more vulnerable to random distortions of trends, but it does appear that professional affiliation is a more meaningful determinant of attitudes.

The measured effect of age on reaction to frustration was evident in a number of trends. Increasing age appears to be associated with greater obstacle denial and less frequent perception of the positive aspects of obstructive situations. It also seemed to facilitate an improved ability to perceive solutions which accommodate all interests as well as delineate responsibility for obstacles and their removal.

Overall levels of participation in outdoor recreation were not strongly correlated with reaction trends in situations involving recreational interests. However, when participation was measured in terms of a particular recreational activity a meaningful relationship was obtained for a stimulus situation which directly implicated that activity. The tendency of hunters and fishermen to respond in terms of obstacle negation to the problem of discriminatory hunting was almost double that of the sample norm. A nine times greater proportion of hunters and fishermen absolutely denied the problem than was the case for non-participants in these activities.

The only available measure of group homogeneity proved less

than reliable. Measured homogeneity and the degree of homogeneity perceived by group members showed practically no agreement whatsoever.

CONCLUSIONS AND APPLICATIONS

The primary hypothesis was in large part supported by the conclusions of this thesis. Response trends were observed to vary in accordance with professional, institutional and biographical factors. The measured strength of these factors in conditioning responses was not, however, as was anticipated. Attitudinal similarities were not in fact greater within institutional groupings than professional groups. Institutional affiliations showed only a weak correlation with response types and consequently cases of overlap between institutional and professional groups did not have the greatest degree of internal homogeneity.

The explanation for this reversal could lie in a number of conditions characteristic of the administrative structure for forest resources management in Alberta. Firstly, there is the fact that the current practice of interdepartmental conference has had a mediating effect on any trend towards the development of attitudes exclusive to particular agencies. Also important is the fact that most of the agencies involved are designed to manage for all or at least a variety of forest uses. They have for these purposes incorporated a number of personnel either to represent uses of subordinate interest to the agency involved or to maintain contact and thus management input from other agencies with different major concerns. From this it appears that perhaps a much more meaningful relationship might have appeared if comparisons had been made on the more specific basis of occupations,

rather than simply agency affiliation. Such an approach might also provide worthwhile insight into the attitudinal effects of placing a specialist into the midst of a group of professionals oriented towards a different facet of resources management. Such a study would probably provide fertile grounds for applying Festinger's theory of cognitive dissonance¹ particularly if conducted so as to outline attitudinal changes through time.

A number of biographical parameters also point towards a likely dominance of professionally-oriented attitudes. The sample group was generally young and highly mobile, which would tend to suggest that there had been little opportunity to overcome attitudes oriented toward their education through prolonged exposure to any particular institution. Also, reading habits and especially memberships were observed to conform strongly to professional affiliations.

Criteria for the resolution of forest management problems were either poorly defined or inconsistent and definitions of the terms "multiple use" and "use conflict" produced no significant degree of consensus. The implications of these results seem to be worthy of some consideration.

Although the wording of the question was to some extent confusing in that it involved a listing of management criteria for problems in general, this does not disguise the fact that few respondents appeared to have any preconceived notions in this regard. This could be interpreted to indicate that most subjects had not, at any time prior to the interview, taken time to rationalize and systematize their criteria for problem resolution. Not only does this imply the prospect of inefficiencies and inconsistencies in management, it also

supports other similar studies in which it was found that the evaluative appraisal behind established problem-solving techniques is seldom questioned or analyzed.²

Although a delineation of preferred forest management criteria for all purposes is a practical impossibility, it is essential that managers be aware of the various criteria which are available to them. A preferential ordering of solution criteria within the bounds of a constricted problem area would be useful but only provided that those who employ this ordering remain aware of the evaluative judgements on which they are based. The resource manager must remain continually aware of the danger of choosing between alternative means with the implicit assumption that the evaluation of goals is accepted.

The difficulties of definition and application which surround the concept of multiple use probably add to the difficulty of comprehending the evaluations which are implicit in resource management decisions. While the provincial government has committed itself to the principle it has yet to attempt any explanation of its intricacies to those who are responsible for its implementation. Undefined, the concept is amenable to any number of different interpretations which can be completely at odds with one another when implemented at the practical level.

The implications of ambiguous terms were further indicated by the wide degree of variance in respondents' definitions of the term "forest land use conflict". Many respondents indicated a low level of familiarity with the term. Those who went beyond the listing of examples or causes, showed that conflicts can exist on any number of three planes: 1) pure demand, 2) administration, and 3) ground level.

Resource managers must certainly remain aware of this fact if conflicts are to be resolved at every level at which they exist.

The sampling of management terms and criteria as they are perceived was limited within this study but it did indicate rather conclusively, the need for governments to standardize their interpretation of key management concepts. The establishment of a priority ratings for management criteria is unreasonable due to the wide variety of issues involved, each of which are dealt with most effectively under their own individual ordering of criteria. However, public resource managers could benefit greatly simply through a greater awareness of the various criteria that are available to them, and the implications of their use or omission. A comprehensive program of research into these matters could not help but improve the management of Alberta's forested lands.

Evidence was found to support the hypothesis that perception of major problems faced by society was conditioned by the perceiver's primary management concern, but results were not conclusive. Much could be gained in terms of cooperation if resource managers were to fully appreciate the effect that this bias can have on the ranking of alternatives.

Response trends from open-ended and restricted choice questions of major problems indicate that forest land use managers, like other professional groups, tend to rank problems encountered within his area of competence as high among all of society's problems. If the professional managers who were interviewed for this study and others like them, are to reach the highest degree of cooperation possible, it is essential that they account for this bias in their dealings with those

whose professional interests may differ.

Finally, as regards the hypothesized inconsistency between measured and perceived levels of attitudinal homogeneity among agency personnel, findings could be regarded as supportive but the lack of precision of the measurement criterion casts doubt on their reliability.

The research also yielded additional information which was not officially incorporated into hypotheses. Respondents, for example, tended to feel that on-the-job training had been considerably more important in preparing them for their current occupations, despite the fact that their attitudes showed far more consistency along professional lines. This is perhaps due to the fact that the respondents have had an opportunity to witness only institutionally-caused changes in their professional attitudes and not the opposite process. Respondents could probably be most effectively made aware of their professional biases in the process of their education. As has been alluded to previously, the bounds of professional bias can be more easily overcome through diversifying reading habits than through organizational membership.

Analysis also indicated that recreational interests can play an important role in conditioning the attitudes of resource managers which relate to such matters. Resource managers involved with recreational interests would apparently be well advised to analyze the degree to which their recreational interests are representative of those of the public as a whole, and make allowances for those inconsistencies which exist.³

Analysis of response trends by professional education led to some interesting applications. Foresters apparently have a strong bias for the use of forested lands for growing timber. This fact was evident in the preferential treatment they gave timber interests in situations involving graziers and watershed values. They seem to have come to accept recreationists, wildlife and to some extent aesthetics as reasonable uses of forested land but have yet to perfect means of managing recreationists. The limitations of Foresters were further outlined in the tabulation of overall response tendencies. Forestry graduates were more prone to deny or denigrate obstacles, to regard obstacles as insurmountable and were hence less likely to suggest solutions. It would appear that if Foresters intend to justify their claim that they are the logical professional group to manage the forest for all uses,⁴ they must broaden their perspective considerably.

Agriculturalists are chiefly notable for denying or denigrating obstacles, while Geographers were considerably below average in establishing blame; an extremely important part of making multiple use operational. Biologists, perhaps accustomed to managing a fragile resource, have the greatest tendency to exclude offending uses.

CONCLUSIONS - MODIFIED PICTURE FRUSTRATION TEST

The adaptation of Rosenzweig's technique represents a relatively novel approach to the measurement of attitudes by Geographers. Although Barker and Burton had previously employed the technique experimentally to test people's reactions to natural hazards,⁵ the present study seems to be the first in which it has been used with complex sources of frustration which do not directly affect the respondent.

The success encountered with the technique in this study

gives rise to optimism as to its potential applications in the field of environmental perception. It provides a simple, quick means of orienting respondents to a variety of discussion topics and is conducive to securing definite opinions rather than broad generalizations and inconclusive replies. Standardization of the stimulus situations improves the chance of delineating meaningful trends in situations where they may not have appeared had attitudes been measured relative to the more complex real environment. With a certain degree of modification, the picture-frustration technique can be made into a reliable instrument to measure the extent to which professional resource managers recognize and cope with problems which arise in their field.

In the course of this research, the author developed certain opinions as to means by which the technique might be refined prior to further use. First, there is a need to allow the respondent considerably more time to complete the test than was possible here. While this would necessarily constrict the bounds of study as far as supplementary data is concerned, it would greatly increase the reliability of the findings. There is little doubt that more time would diminish the number of obstacle dominant responses and evoke a greater number of more elaborate solutions.

Another observation relates to the open answer format used by Rosenzweig and in this study. This type of approach frequently results in having respondents adopt loose literary forms and broad generalizations in their answers. This naturally leads to greater subjectivity and coding problems and generally less reliable data. Also, the picture frustration test was originally designed to evoke quick reactions rather than extended rationalizations. For present

purposes, the technique requires a revised format for answers which will encourage responses that are codable by all the coding schemes it uses. The author recommends that a suggestive answer format be employed for all cartoons. Respondents should be asked specifically 1) does this situation represent an obstacle?, 2) if yes, who is to blame for its occurrence, 3) can the obstacle be overcome?, 4) if so, how?, 5) if so, who is responsible for overcoming it? Such an approach would undoubtedly accelerate the interview process as well as clarifying responses and simplifying coding. While it will most likely encourage a disproportionate number of solution-oriented answers and perhaps somewhat fewer obstacle denials, the overall effect should be to facilitate the respondent's rapid consideration of all the facets of the problem which he normally would in his everyday decision-making capacity.

Other improvements which could also be made include allowances for the coding of implied (as opposed to over) response tendencies⁶ but this facet should be reserved for the experienced experimenter, and development of a more sophisticated means of measuring group conformity. More reliable conformity ratings could conceivably be facilitated through either larger sample groups or an empirically-based grouping of response types. Some preliminary (perhaps Likert-styled) investigation of respondents' appraisals of the severity of problems to be dealt with and their experience (either professional or personal) with them would be advisable. An open-ended format is apparently of little use in this regard.

Three final cautions seem warranted with regard to cartoon design and response coding. Particular care should be exercised in the

design of cartoon details. It was found that respondents did not use the cartoon background simply to locate his own position in the frustrating situation, but tended to focus on details of the cartoon characters' surroundings, particularly if something seemed inconsistent with current management practice as they perceived it. Investigators should also avoid suggesting any of the coding components which he seeks to measure (e.g., blame, solution), as this complicates the stimulus and hence the reaction, and repressed originality of thought in this regard. Finally, the researcher should be aware of the coding problem which occasionally arises because his interpretation and that of the subject as to what consists as a solution are at variance. This situation need present no problem so long as its existence is recognized and such responses are coded consistently.

AN OVERVIEW

The findings of the study have important implications both to the professional groups involved and to the growing number of people interested in the attitudes and perception of resource managers. They are descriptive of the effect of professional, institutional and biographical factors where professional and institutional groups are closely intermingled; a situation which had not to date been explored. The fact that professional affiliations continued to exert an effect on attitudes in this situation lends further weight to recognition of the need for interdisciplinary approaches to resource management problems. The realignment of priorities and required management skills should lead to continued expansion of the roles of Recreation Managers, Geographers, Biologists, and Watershed Scientists, while Foresters

tend to decline in relative (though not absolute) importance. However, it should be noted that any such decline in the importance of Foresters could be avoided through an increased emphasis on supplemented and broadened educational programs. Probably the most effective means of overcoming professional bias would be the introduction of a compulsory course at the undergraduate level; a course 1) to outline the distinction between facts and values; 2) to familiarize the student with the evaluative judgements behind many of his assumptions; 3) to introduce him to the types of bias which he should expect from his and other professional groups, and; 4) to recommend means of adjusting for one's own bias and accommodating those of others.

Results of the study may also be useful as a guide for empirically-based research in the future. Conclusions such as were reached here will aid the researcher who investigates the actual decision-making environment to know which factors to hold constant in order that attitudinal variations prompted by differences in the physical environment can be most readily identified.

REFERENCES AND FOOTNOTES

- ¹ Leon Festinger, A Theory of Cognitive Dissonance, Standord Univ. Press, Stanford, Calif., 1962.
- ² Timothy O'Riordan, Perspectives On Resource Management, Pion Ltd., London, 1971, p. 107.
- ³ Taking care, for instance, that the Forest Manager who is also a hiking enthusiast does not underestimate the importance of the recreational values of other outdoor recreational activities with which he is less familiar.
- ⁴ See for instance: H.R. Glascock, Jr., "Foresters and Environmental Quality", Journal of Forestry (1967), Vol. 65, pp. 378-380; L.C. Merriam, Jr., "The Challenge of Changing Forest Use", Journal of Forestry (1970), Vol. 68, pp. 289-293; and, S.H. Spurr, "Forestry As A Profession", Journal of Forestry (1968), Vol. 66, p. 30.
- ⁵ Mary L. Barker and Ian Burton, "Differential Response To Stress In Natural and Social Environments: An Application of a Modified Rosenzweig Picture Frustration Test", Natural Hazard Research Paper No. 5, University of Toronto, Dept. of Geography, Toronto, 1969.
- ⁶ Although this could conceivably lead to considerable differences in coding interpretation from one scorer to the next.

A P P E N D I C E S

INTERVIEW QUESTIONNAIRE

Appendix A

1. How long have you been in your present position? _____ years.
2. What do you consider to be your basic discipline? _____
3. What do you feel are the major problems (both governmental and otherwise) which face Alberta today?
 - i. _____
 - ii. _____
 - iii. _____
 - iv. _____
 - v. _____
4. How do forest management problems rank with other problems presently faced in Alberta?
 - i. of little importance _____
 - ii. somewhat important _____
 - iii. important _____
 - iv. very important _____
5. There seems to be an increasing concern over forest land use conflicts in Alberta. Do you feel that this concern is justified?
Yes _____ No _____ If yes, in what ways?
 - i. _____
 - ii. _____
 - iii. _____
6. On what basis would you identify a conflict in forested land use?
What is required is a definition.

7. What types of forest management problems have you been confronted with over the past three to four years?

i. _____

ii. _____

iii. _____

iv. _____

v. _____

8. What is the procedure you commonly use to deal with problems of land use conflict on forested land?

9. What groups and individuals do you generally have cause to consult with (both within and outside the department) prior to making a final decision?

within: _____

outside: _____

10. What agencies or groups most often require the accomodation of their views prior to the final formulation of your policy?

What is the nature of their objections and how are they resolved?

11. How do you generally become aware of clashes in resource use?

a) complaints _____ their origin? _____

b) casual conversation _____ with whom? _____

c) personal observations _____ on what occasions? _____

d) surveys _____ their originator? _____

e) public meetings _____ which? _____

f) mass media _____

g) other departments _____

h) field staff _____

i) other _____

12. What criterion do you consider most important in the resolution of forest management problems with which you are involved?

(e.g., economic, ecological, aesthetic, public opinion, physical, technical, etc.)

13. How would you describe your role in the management of forested lands?

14. Are professionals of your class better equipped than anyone else to handle the problems you do, or could any college graduate (regardless of his background perform an effective job?

Yes _____ No _____

Explanation: _____

15. Can you think of any one existing decision-making body which would be capable of effectively handling the full range of management problems on forested lands?

If yes, what makes this agency so capable?

16. In your opinion, is the present legislative and administrative framework adequate to handle the various forest management problems encountered here in Alberta? Yes _____ No _____
- What improvements might be made to present legislation or its administration in order to make the management of forested lands more effective?

i. _____

ii. _____

17. What would you consider to be the major cause of difficulties in present-day efforts to manage the forest for many products?

18. Is the concept of multiple use of any worth in solving the problems of managing forested land?
- a) no worth _____
- b) some worth _____
- c) considerable worth _____
- d) great worth _____
19. Is the concept of multiple use being successfully applied in the forested areas of Alberta today? Yes _____ No _____
- If not, what are the major barriers preventing such successful application?
- i. _____
- ii. _____
- iii. _____
20. The concept of multiple use has been defined in many ways. Which of the following best describes your interpretation of the principle?
- _____ a) zoning for the best single use of all land units.
- _____ b) planning for the best sequence of single uses over time for a particular land unit.
- _____ c) planning for the best simultaneous mix of uses for a particular land unit at a particular time.
- _____ d) other: _____
21. To what extent do the members of your administrative unit share the same outlooks and opinions regarding the management of forested lands?
- a) little similarity _____
- b) some similarity _____

c) considerable similarity _____

d) great similarity _____

Time required: _____ minutes

Interest: a) not interested _____

b) interested _____

c) very interested _____

Cooperation: high _____

average _____

low _____

PICTURE-FRUSTRATION CODING

Appendix B

ON

- ON(1) - obstacle denigrated
- ON(2) - obstacle denied
- ON(3) - obstacle actually beneficial (or accompanied
by other beneficial effects)
- ON(4) - insufficient reason to curb offending use/
user
- ON(5) - attacked use would provide no worthwhile
return anyway

Responsibility

Intropeditive (IntroP) - fault of government (either
political or administrative)

For Obstacle

Extrapeditive (ExtraP) - fault of party implied to
be offensive (ExtraP(1)) or other non-
governmental party involved (ExtraP(2))

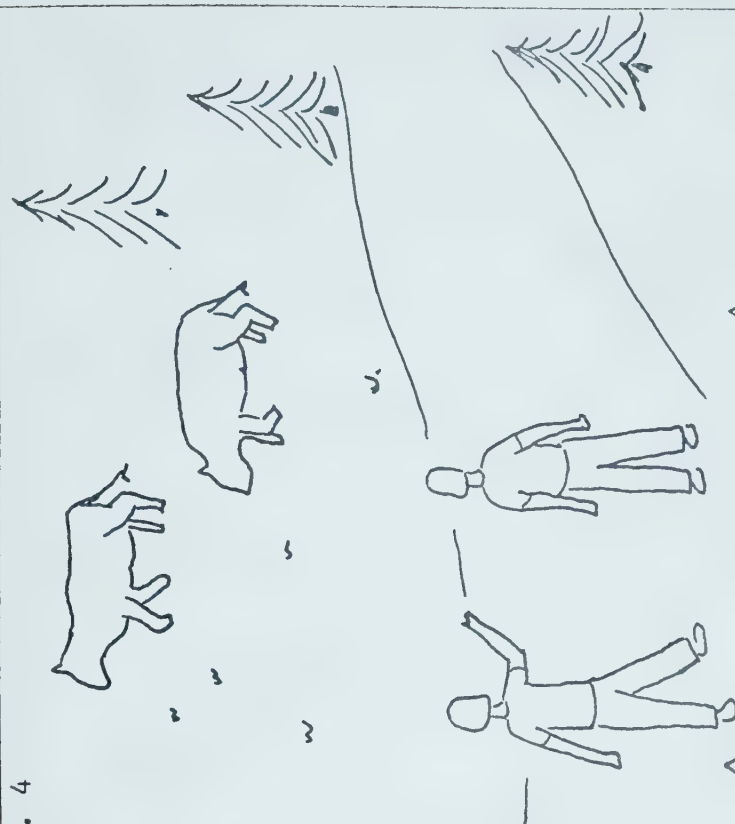
Impeditive (Imp) - no one at fault. Outlined problem
to be expected

OD

- OD - obstacle dominant - in absence of stress on
solution (NP) or denial of obstacle (ON(2)).
- OD(1) - value judgement in preference for status quo
- OD(2) - change would be detrimental
- OD(3) - difficult to manage if changed
- OD(4) - offended user has no right to object
- OD(5) - make best of situation through small
reparations
- OD(6) - other reasons why attack is warranted
- OD(7) - resigned to past abuses

| | |
|-----------------------|---|
| <u>NP</u> | NP - stress on solution of problem |
| | NP(S-1) - if <u>striving</u> for solution is stressed but no specific solution is suggested |
| <u>Responsibility</u> | Intropersistive (IntroP) - responsibility of government |
| <u>For Solution</u> | to initiate solution |
| | Extrapersistive (ExtraP) - responsibility of party implied offensive (ExtraP(1)) or other parties directly involved in conflict (ExtraP(2)) |
| <u>Type of</u> | S-1 - conciliation of uses/elimination of damage |
| <u>Solution</u> | S-2 - penalize offending party |
| | S-3 - exclude offending party |
| | S-3/1 - exclude offending party if overall costs associated with its presence exceed overall benefits |
| | S-4 - have offender repair damage, compensate for damages; held responsible for damages |

No. 4

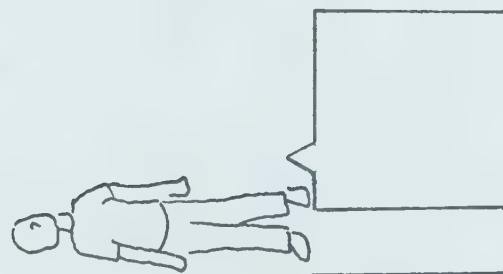


You know, it's one thing to allow grazers to take advantage of forest clearings but it's quite another to absorb the additional costs to timber operations because of the need to respect their rights.

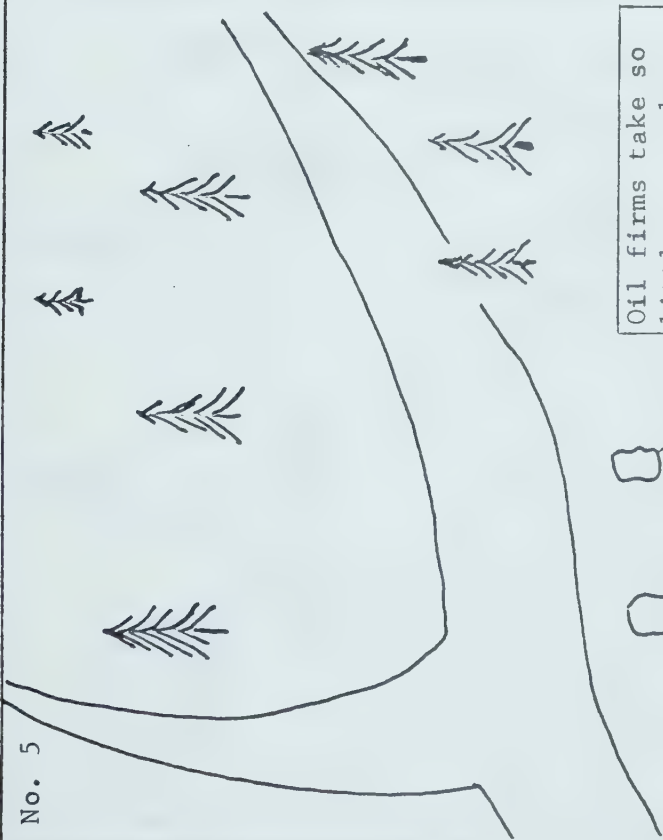
No. 1



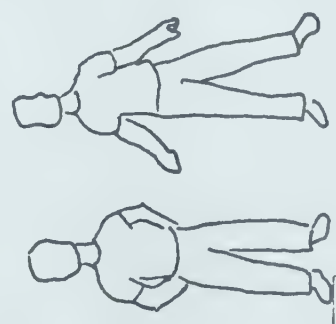
The high altitude forests remain unconditionally closed to timber operations. The area is far too important for the control of late season snow melt.



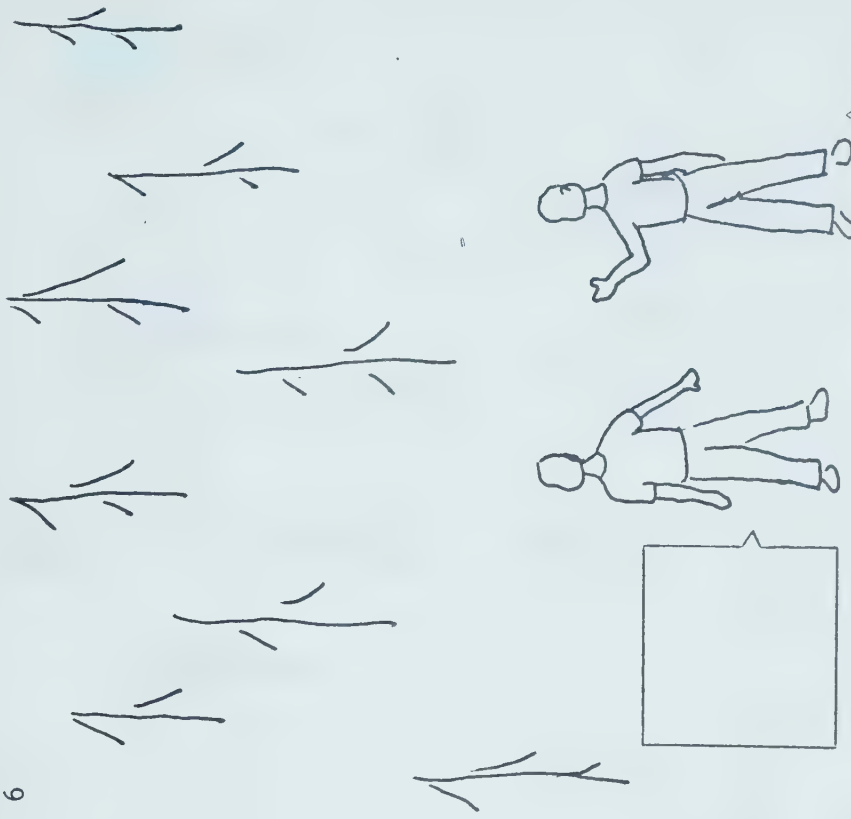
No. 5



Oil firms take so little care planning their original routes that it becomes necessary to waste additional forested land for purposes of permanent access.

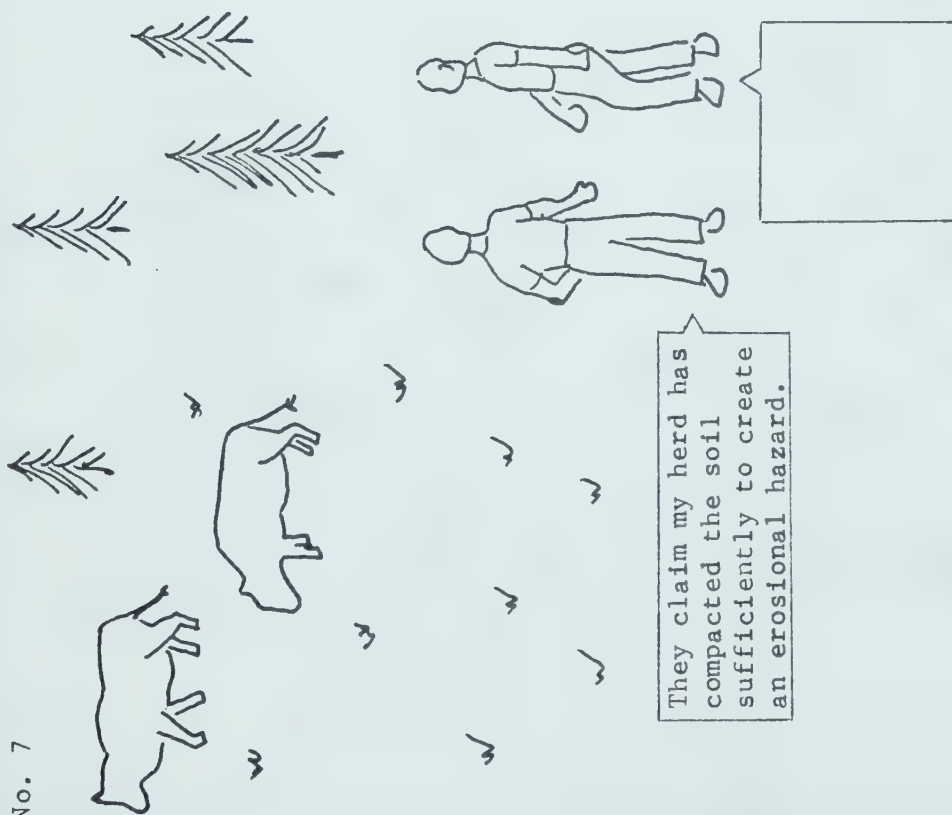


No. 6

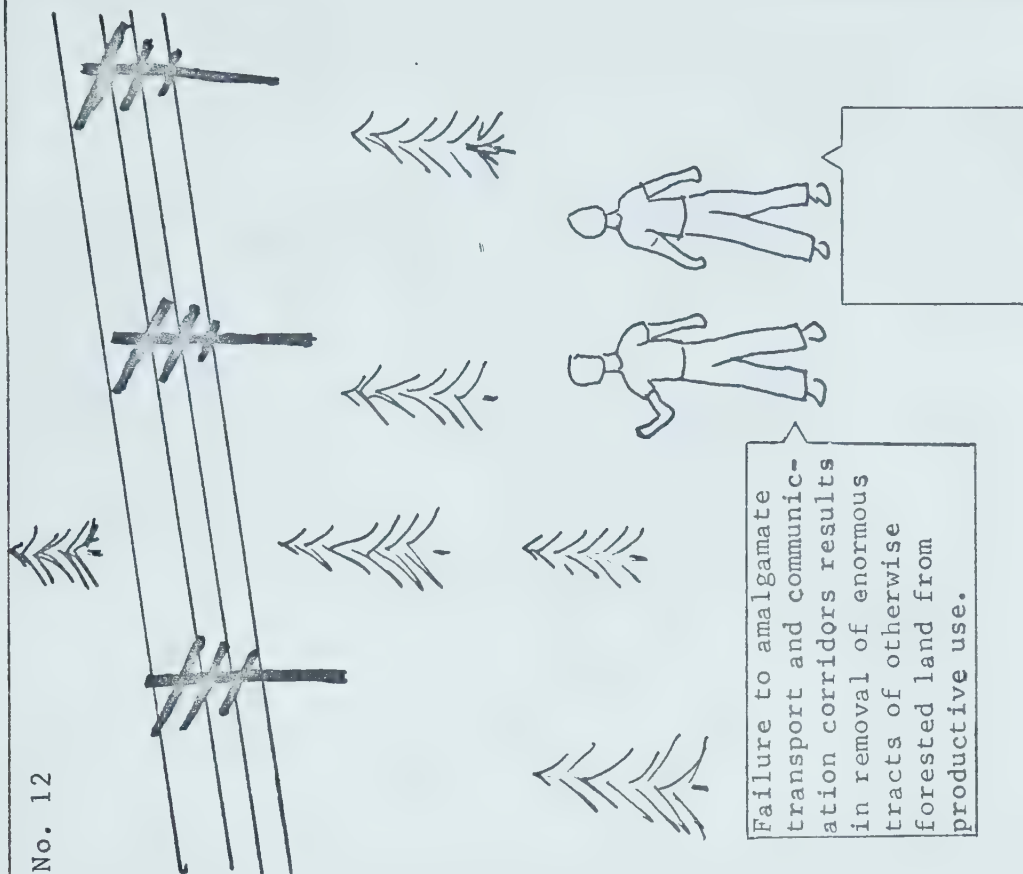


When I see the awesome results of a forest fire like this I can't help but think that the best thing we can do is to keep people out of the woods.

No. 7



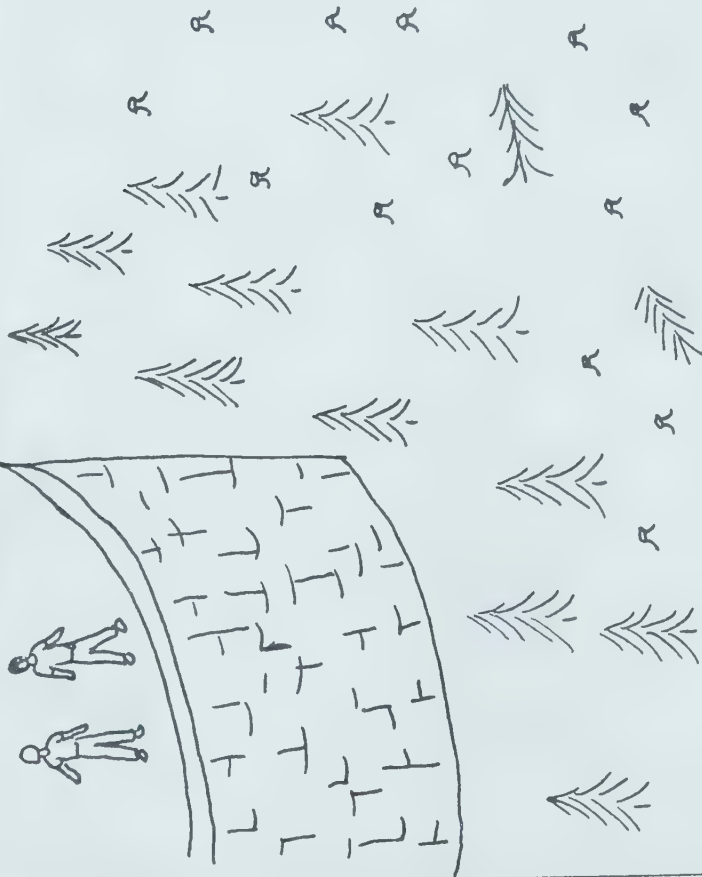
No. 12



No. 13

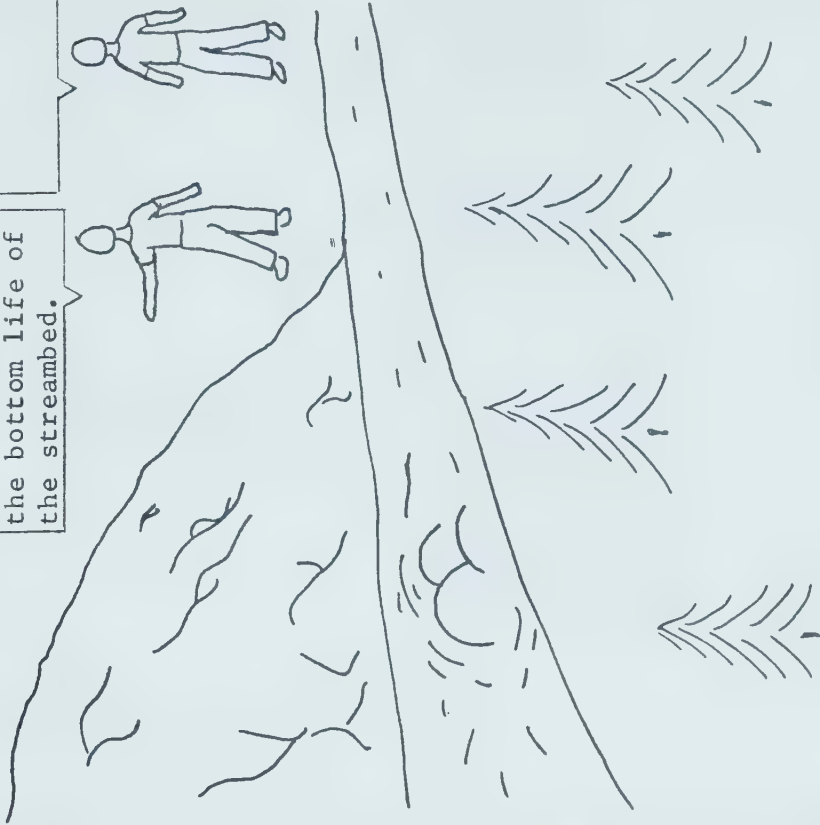


Nothing spoils a scenic view more effectively than the sight of an area of recent timber harvest.

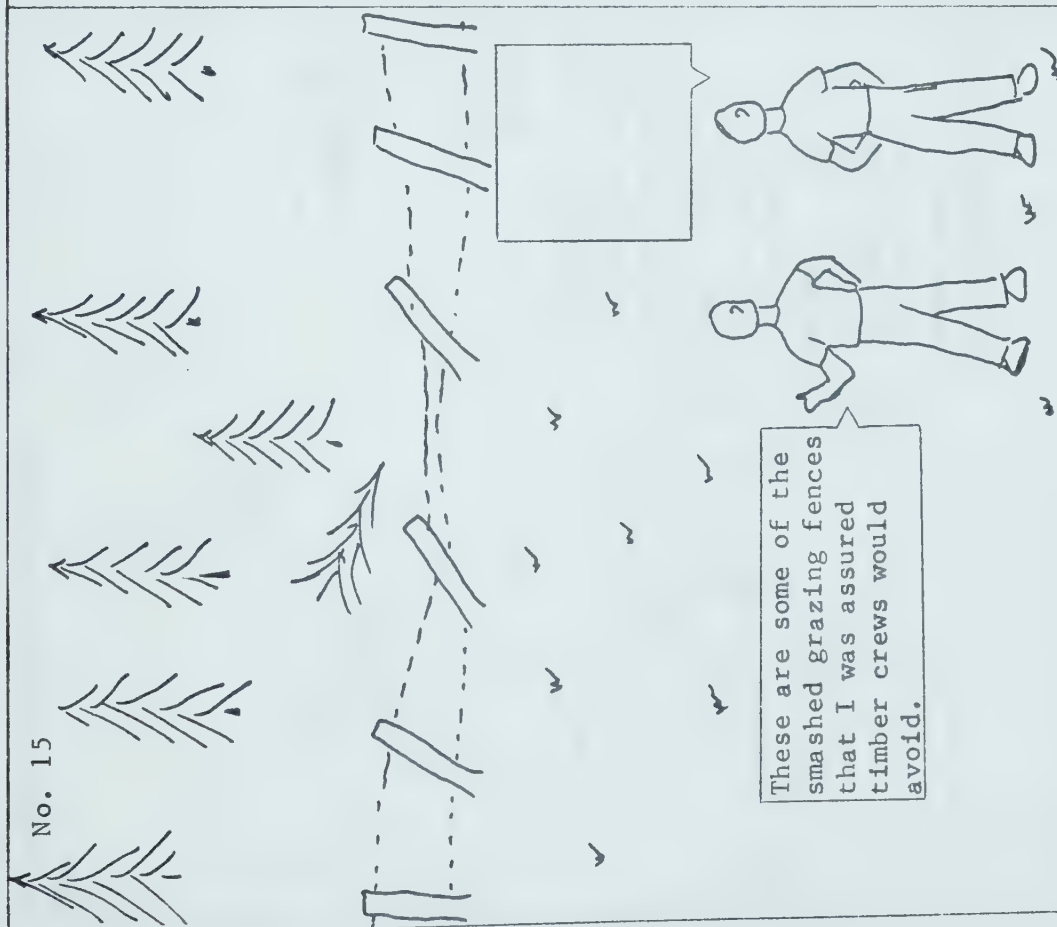


No. 14

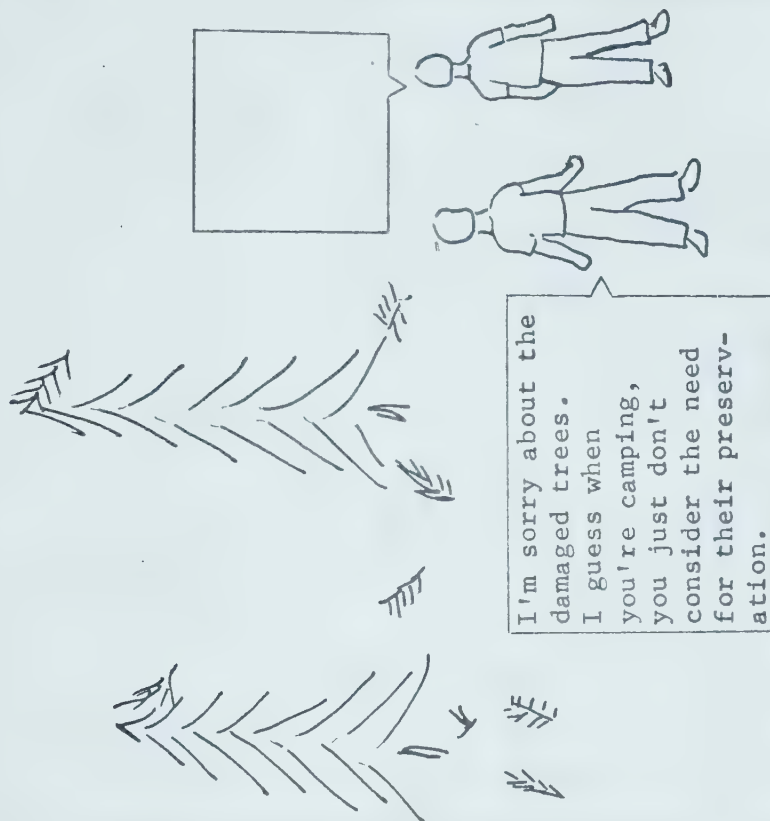
The deposits from that strip-mining operation have completely smothered the bottom life of the streambed.



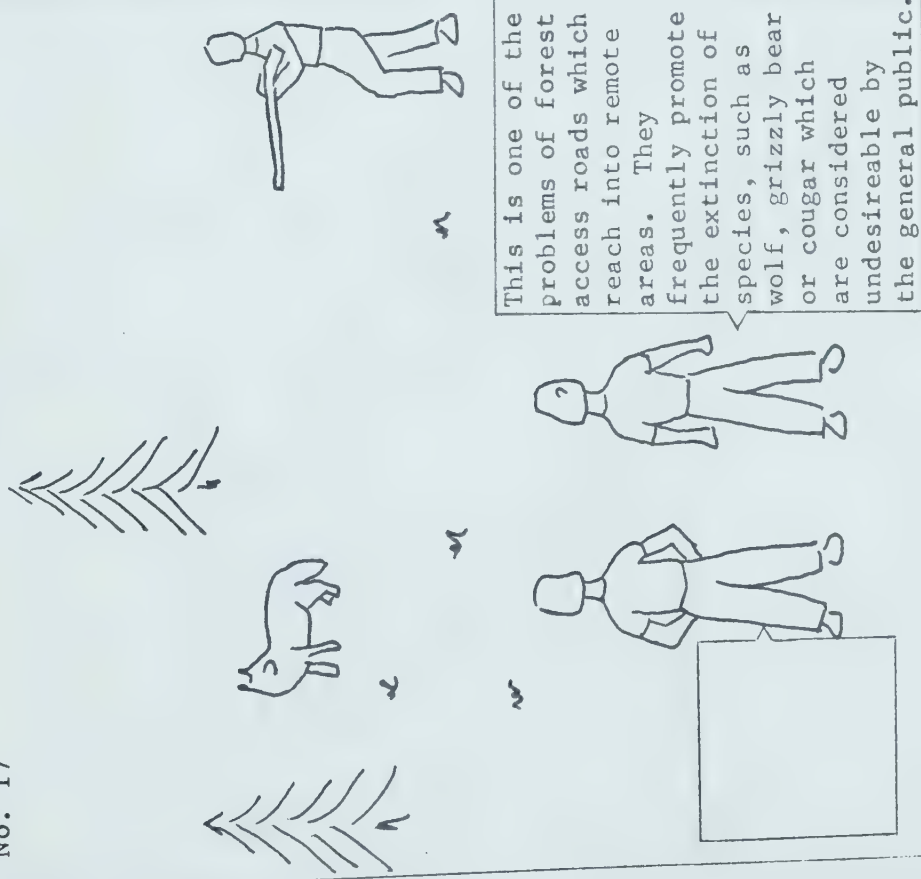
No. 15



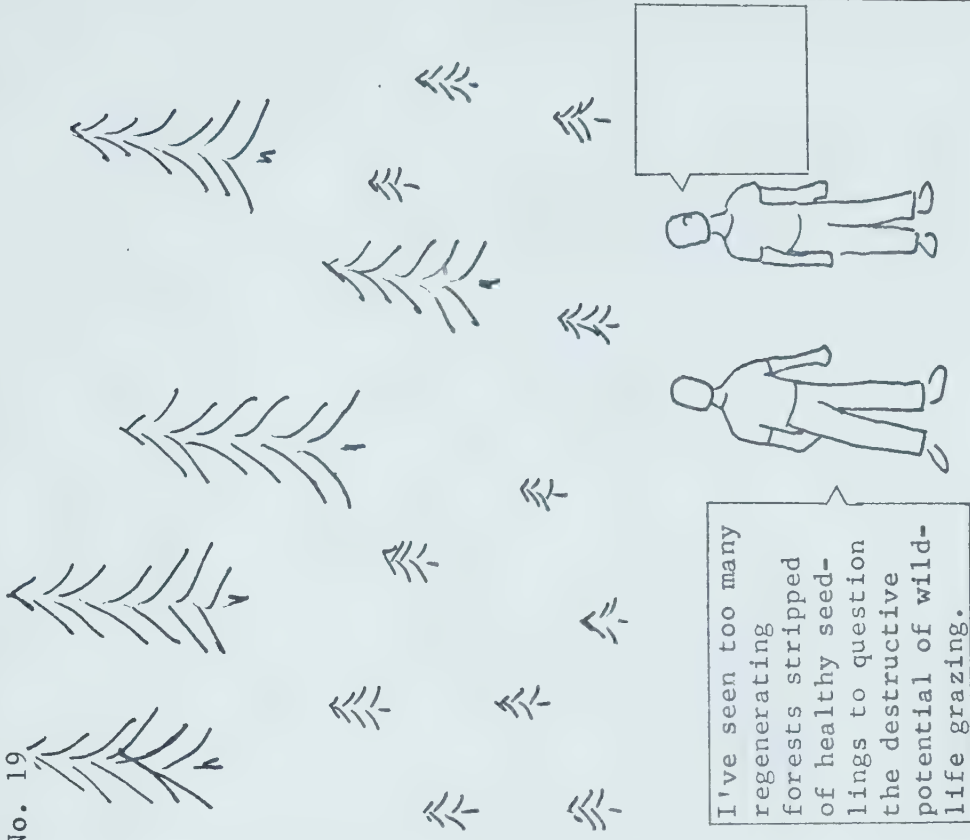
No. 16



No. 17

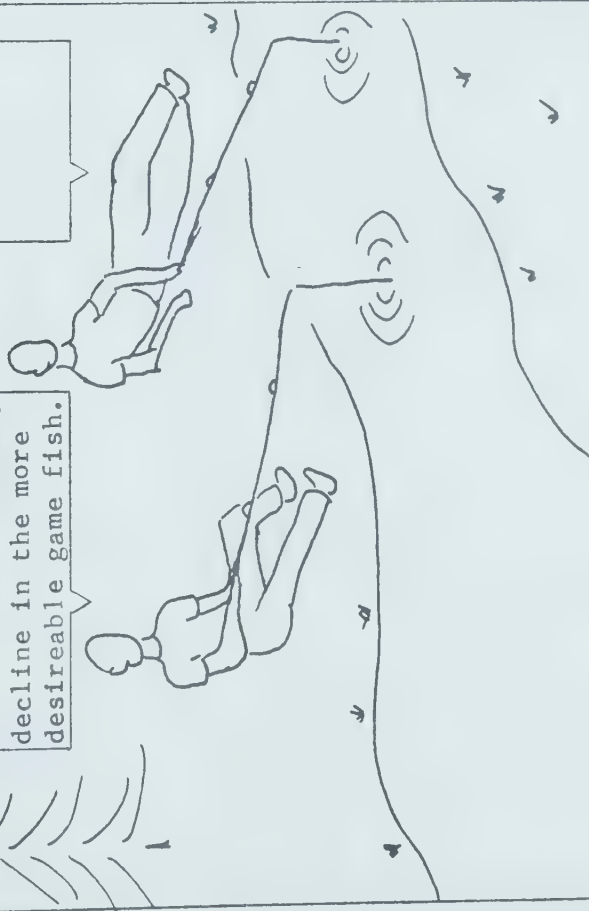


No. 19



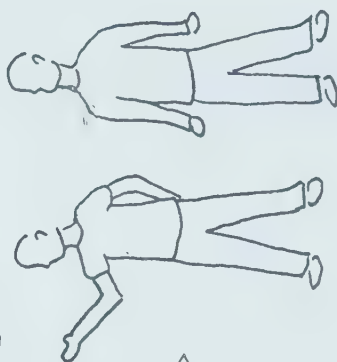
No. 2

You know, ever since they logged along our favorite steam there's been a steady decline in the more desirable game fish.

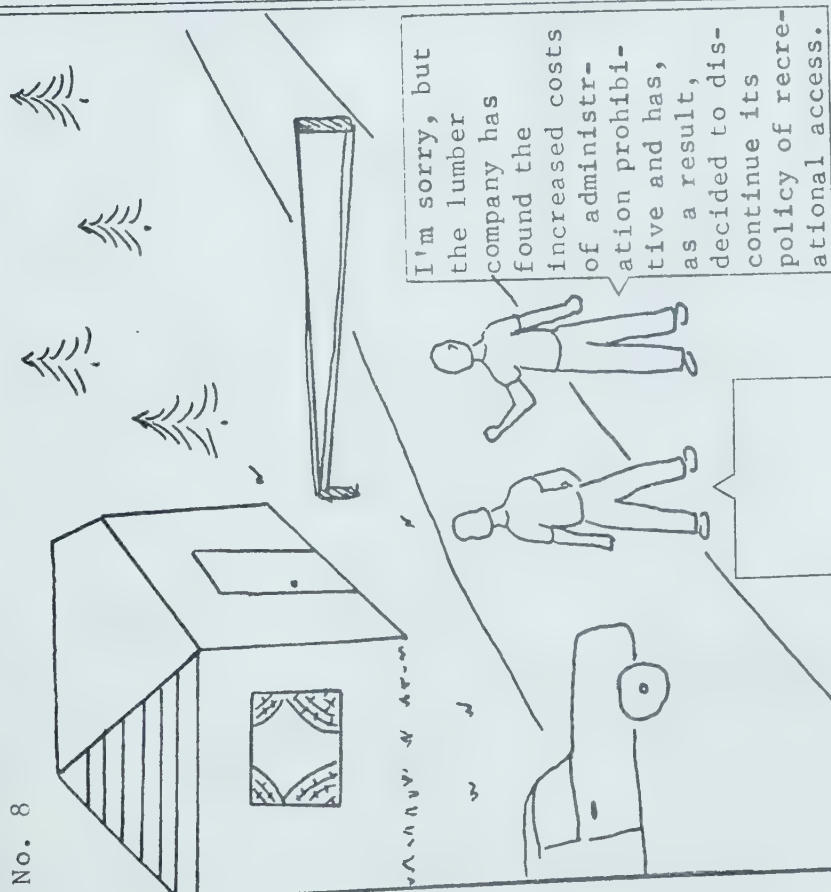


No. 3

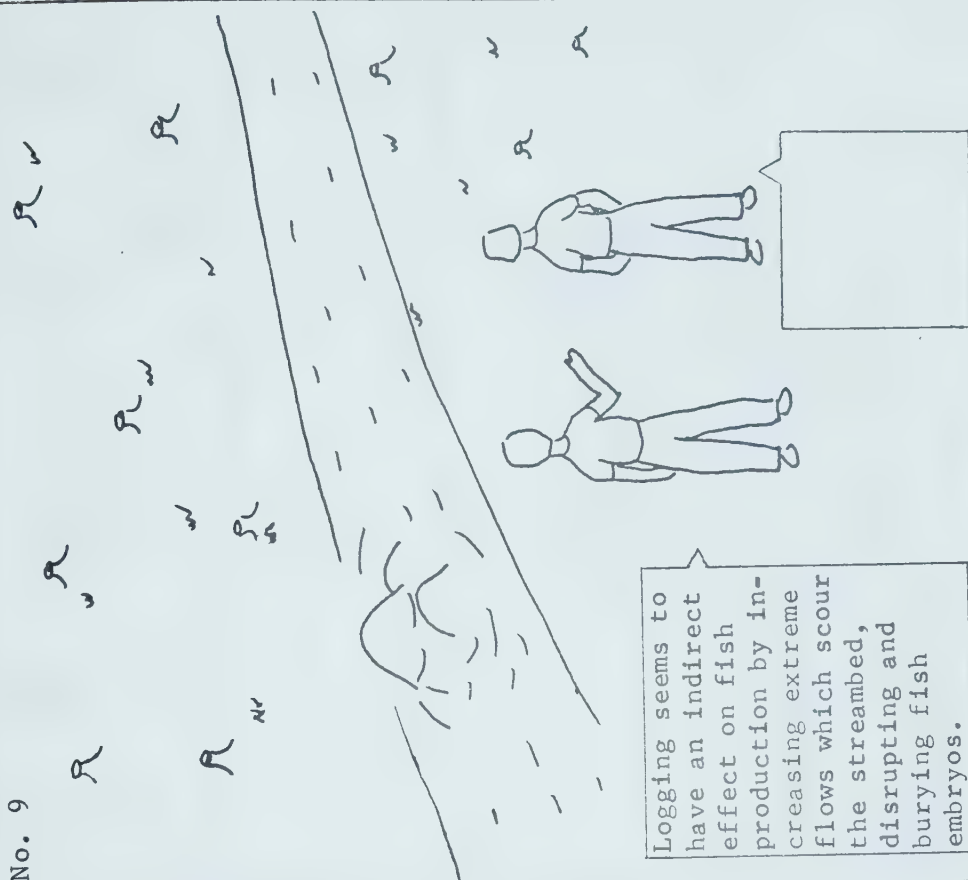
It's a vicious circle. These spoil banks require at least three years of leaching prior to successful recolonization but without vegetation to stabilize them the required period is steadily lengthened.



No. 8



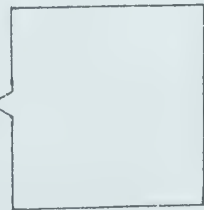
No. 9



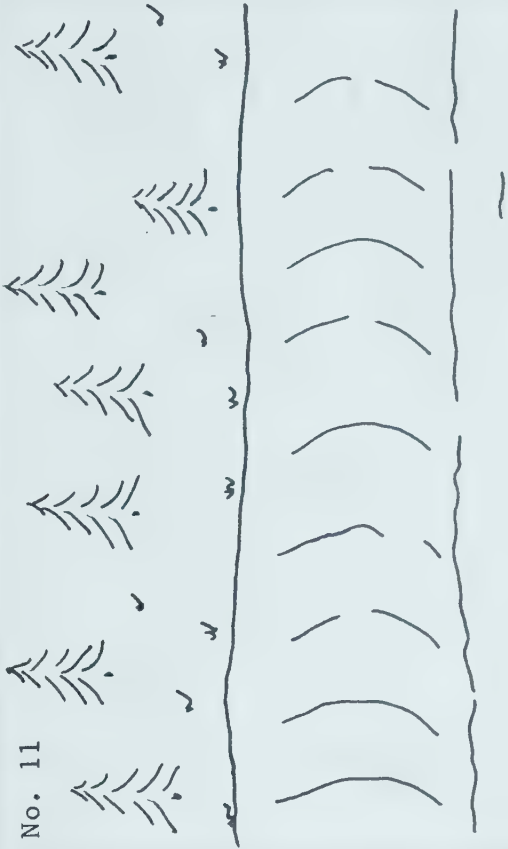
No. 10



The high concentration of beavers in this area has caused the loss of countless acres of otherwise commercial woodlands.



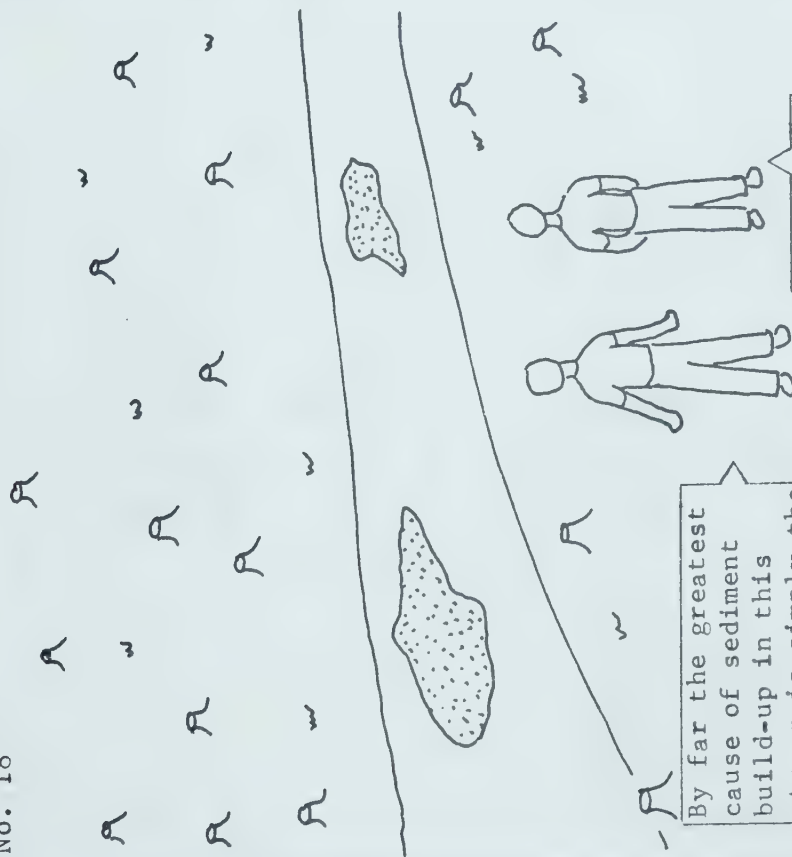
No. 11



Of course the preservation of these shoreline stands for recreationists is no guarantee that they will in fact endure. In some cases the windfalls are so numerous that it would have been better to log them in the first place.



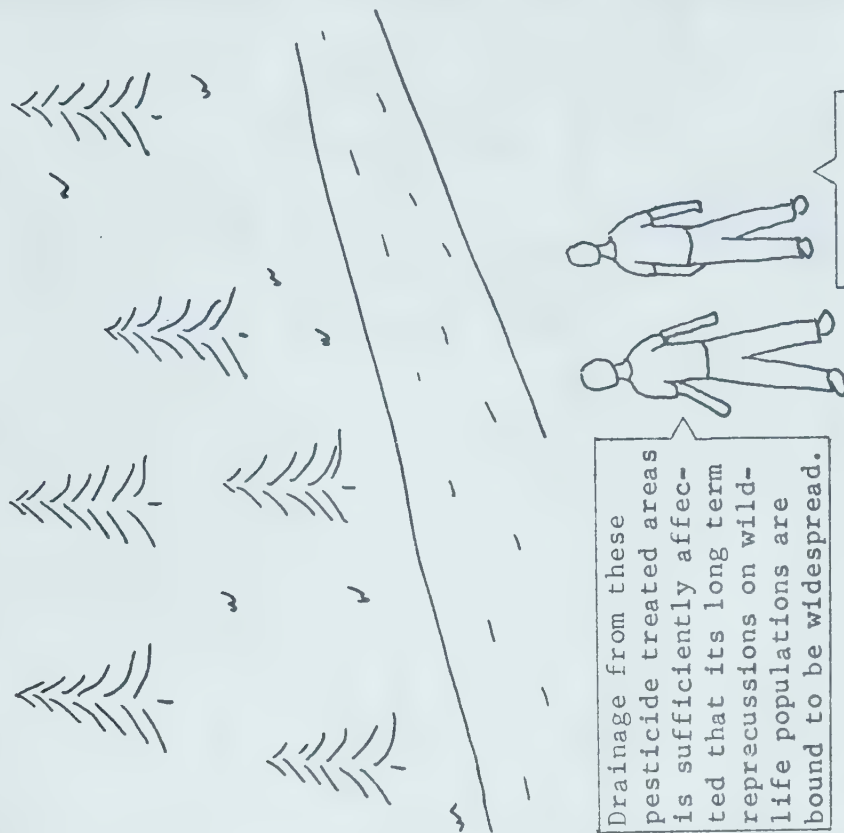
No. 18



By far the greatest cause of sediment build-up in this stream is simply the product of log-skidding and road construction.



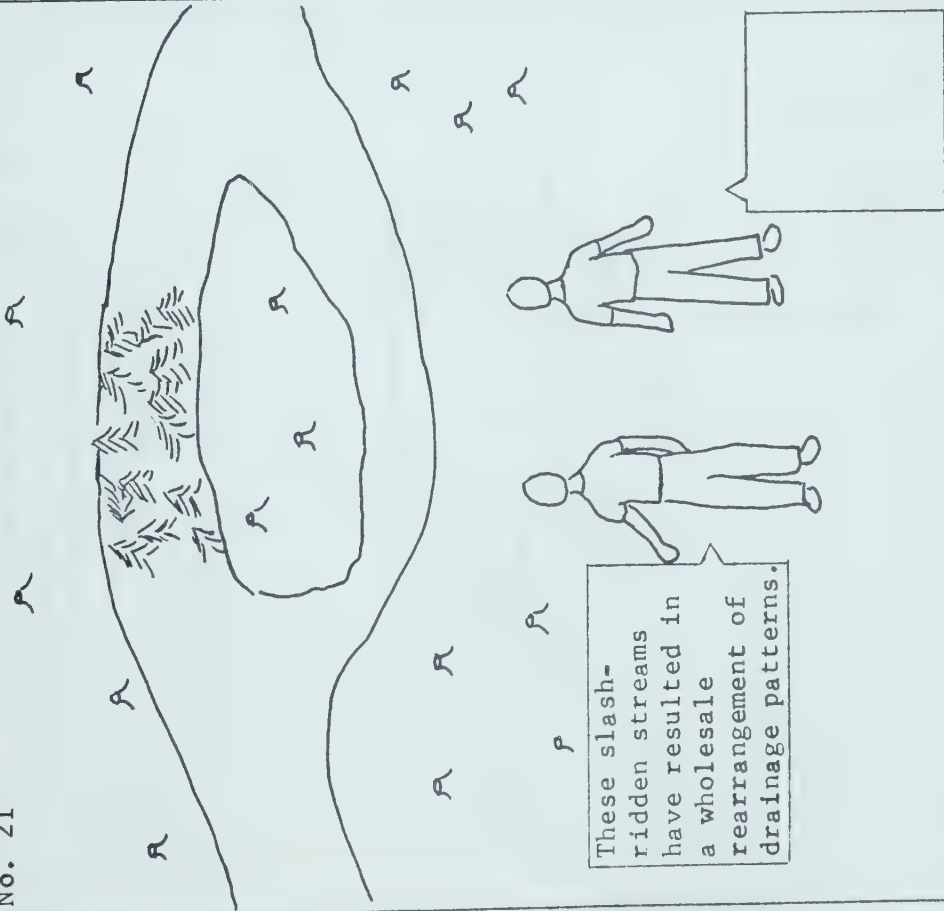
No. 20



Drainage from these pesticide treated areas is sufficiently affected that its long term repercussions on wildlife populations are bound to be widespread.



No. 21



These slash-ridden streams have resulted in a wholesale rearrangement of drainage patterns.

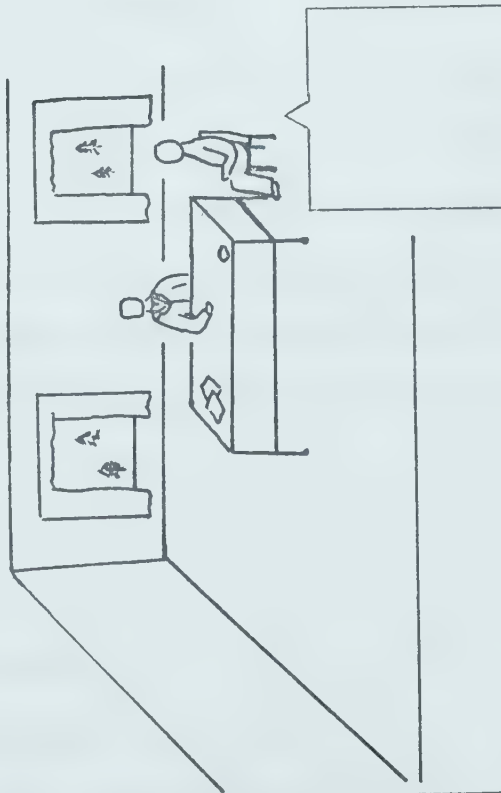
No. 22

The precipitation of sewage solids by iron and aluminum sulfates released in strip mining operations may be of little immediate significance to mankind but they could produce a health hazard when flushed out during periods of high water.

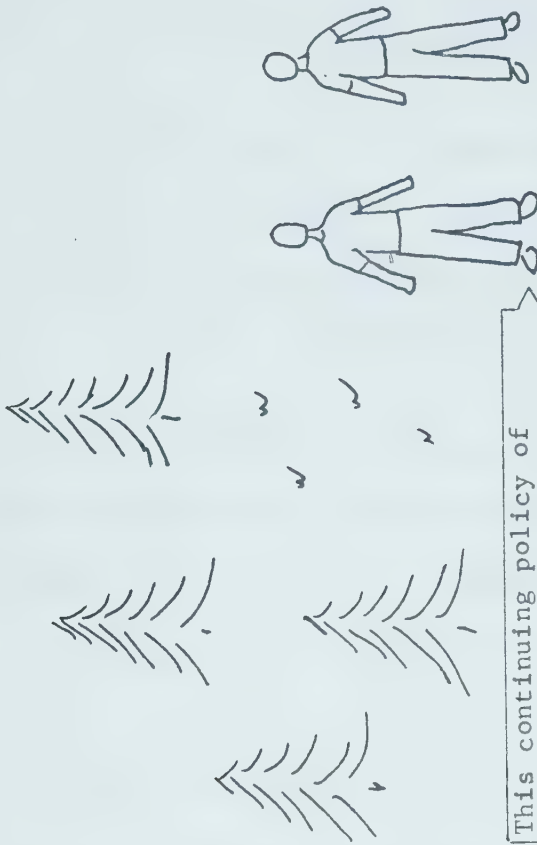


No. 23

No, I'm not granting permission for the construction of access roads during the winter months because the erosional effects are not then evident and this generally leads to their neglect in favour of minimizing the distance and time required for construction.



No. 24



This continuing policy of harvesting timber at, or prior to, the climax stage has led to an unprecedented population explosion of deer while, at the same time, virtually eliminating the caribou species.

MAILING QUESTIONNAIRE

Appendix C

This section of the questionnaire is to be completed at your own discretion - preferably as soon after the interview as possible. In its absence, the previously completed portions of the questionnaire are useless. A stamped, addressed envelope is provided for your convenience.

1. What is your present age? _____ years.
2. Which universities or training institutes have you attended?

| | | |
|---------------|---------------|----------------|
| <u>school</u> | <u>course</u> | <u>diploma</u> |
|---------------|---------------|----------------|

3. What positions have you held prior to your current occupation?

| | | |
|-----------------|-----------------|-----------------|
| <u>position</u> | <u>employer</u> | <u>duration</u> |
|-----------------|-----------------|-----------------|

4. What was the main reason for your deciding to enter your present field? If more than one reason, please rank 1, 2, 3 . . .

- _____ a) chance
- _____ b) personal contacts
- _____ c) work content
- _____ d) working conditions
- _____ e) education/training

_____ f) "calling"

_____ g) "stepping stone"

_____ h) other: _____

5. What knowledge or experience acquired prior to entering your current post have you found particularly valuable in your work?

6. What organizations do you belong to?

Professional

Non-Professional

7. What publications do you read on a regular basis?

Professional Journals

Non-Professional Journals

8. Leisure time activities: Indicate in order of preference the five main activities you engage in. (1, 2, 3 . . .)

_____ a) visiting with friends, partying, dancing, etc.

_____ b) reading, watching T.V., listening to music

_____ c) going to plays, concerts, lectures, museums

_____ d) driving for scenery

_____ e) participating in clubs and other community organizations

_____ f) gardening and working in the yard

- _____ g) photography
- _____ h) workshop and homemaking hobbies
- _____ i) sports (e.g., golf, curling, hockey, soccer, etc.)
- _____ j) outdoor swimming or going to the beach
- _____ k) boating, canoeing, and water skiing
- _____ l) fishing or hunting
- _____ m) hiking or nature walks
- _____ n) other: _____

FREQUENCY OF OCCURRENCE OF RESPONSE TYPES Appendix D
BY PROFESSIONAL EDUCATION FOR CARTOON NO. 1

(expressed as aggregates and as percentages of the total sample)

| Response Type \ Profession | Agriculture | | Forestry | | Geography | | Biological Sciences | |
|-------------------------------|-------------|------|----------|------|-----------|-------|------------------------|------|
| | # | % | # | % | # | % | # | % |
| ON(1) | 1 | 10.0 | 1 | 7.7 | | | | |
| ON(2) | | | | | | | | |
| ON(3) | 1 | 10.0 | 2 | 15.4 | 2 | 18.2 | | |
| ON(4) | | | 1 | 7.7 | | | | |
| ON(5) | 1 | 10.0 | 2 | 15.4 | | | 2 | 33.3 |
| Total ON | 3 | 30.0 | 6 | 46.1 | 2 | 18.2 | 2 | 33.3 |
| IntroP | | | | | | | | |
| ExtraP(1) | | | | | | | | |
| ExtraP(2) | | | | | | | | |
| ExtraP(3) | | | | | | | | |
| Imp | | | | | | | | |
| Total RO | | | | | | | | |
| OD | | | | | | | | |
| OD(1) | 6 | 60.0 | 8 | 61.5 | 7 | 63.6 | 3 | 50.0 |
| OD(2) | 1 | 10.0 | 1 | 7.7 | | | | |
| OD(3) | | | | | | | | |
| OD(4) | | | | | | | | |
| OD(5) | | | | | | | | |
| OD(6) | 1 | 10.0 | | | 4 | 36.4 | 2 | 33.3 |
| OD(7) | | | | | | | | |
| Total OD | 8 | 80.0 | 9 | 69.2 | 11 | 100.0 | 5 | 83.3 |
| IntroP | 1 | 10.0 | | | | | | |
| ExtraP(1) | | | | | | | | |
| ExtraP(2) | | | | | | | | |
| MultiP | | | | | | | | |
| Total RS | 1 | 10.0 | | | | | | |
| NP(S-1) | 1 | 10.0 | 3 | 23.1 | 1 | 9.1 | 1 | 16.7 |
| S-1 | 2 | 20.0 | 3 | 23.1 | 2 | 18.2 | | |
| S-2 | | | | | | | | |
| S-3 | | | | | | | | |
| S-3/1 | | | | | | | | |
| S-4 | | | | | | | | |
| Total NP | 3 | 30.0 | 6 | 46.1 | 3 | 27.3 | 1 | 16.7 |

FREQUENCY OF OCCURRENCE OF RESPONSE TYPES
BY PROFESSIONAL EDUCATION FOR CARTOON NO. 4

(expressed as aggregates and as percentages of the total sample)

| Profession Response Type | Agriculture | | Forestry | | Geography | | Biological Sciences | |
|--------------------------------|-------------|------|----------|------|-----------|------|------------------------|------|
| | # | % | # | % | # | % | # | % |
| ON(1) | 1 | 9.1 | | | 2 | 18.2 | | |
| ON(2) | 2 | 18.2 | 2 | 15.4 | 1 | 9.1 | 1 | 16.7 |
| ON(3) | 3 | 27.3 | | | | | | |
| ON(4) | | | | | | | | |
| ON(5) | | | | | | | | |
| Total ON | 6 | 54.5 | 2 | 15.4 | 3 | 27.3 | 1 | 16.7 |
| IntroP | | | 1 | 7.7 | | | | |
| ExtraP(1) | 2 | 18.2 | 6 | 46.1 | 4 | 36.4 | 3 | 50.0 |
| ExtraP(2) | 2 | 18.2 | | | | | | |
| ExtraP(3) | | | | | | | | |
| Imp | 1 | 9.1 | | | | | | |
| Total RO | 5 | 45.5 | 7 | 53.8 | 4 | 36.4 | 3 | 50.0 |
| OD | 2 | 18.2 | 3 | 23.1 | 2 | 18.2 | | |
| OD(1) | 1 | 9.1 | | | | | | |
| OD(2) | | | | | | | 1 | 16.7 |
| OD(3) | | | | | | | | |
| OD(4) | | | | | | | | |
| OD(5) | | | | | | | | |
| OD(6) | | | 1 | 7.7 | 1 | 9.1 | | |
| OD(7) | | | | | | | | |
| Total OD | 3 | 27.3 | 4 | 30.8 | 3 | 27.3 | 1 | 16.7 |
| IntroP | 3 | 27.3 | 4 | 30.8 | 7 | 63.6 | 2 | 33.3 |
| ExtraP(1) | 1 | 9.1 | | | | | | |
| ExtraP(2) | | | | | | | | |
| MultiP | | | 2 | 15.4 | | | 1 | 16.7 |
| Total RS | 4 | 36.4 | 6 | 46.1 | 7 | 63.6 | 3 | 50.0 |
| NP(S-1) | | | 2 | 15.4 | | | 1 | 16.7 |
| S-1 | 1 | 9.1 | 1 | 7.7 | | | 1 | 16.7 |
| S-2 | | | | | | | | |
| S-3 | | | 3 | 23.1 | 2 | 18.2 | 1 | 16.7 |
| S-3/1 | 1 | 9.1 | 1 | 7.7 | 3 | 27.3 | | |
| S-4 | 2 | 18.2 | | | 3 | 27.3 | 2 | 33.3 |
| Total NP | 4 | 36.4 | 7 | 53.8 | 8 | 81.8 | 5 | 83.7 |

FREQUENCY OF OCCURRENCE OF RESPONSE TYPES
BY PROFESSIONAL EDUCATION FOR CARTOON NO. 5

(expressed as aggregates and as percentages of the total sample)

| Profession Response Type | Agriculture | | Forestry | | Geography | | Biological Sciences | |
|--------------------------------|-------------|------|----------|------|-----------|------|------------------------|------|
| | # | % | # | % | # | % | # | % |
| ON(1) | 3 | 27.3 | 2 | 15.4 | 2 | 18.2 | | |
| ON(2) | 1 | 9.1 | | | | | | |
| ON(3) | | | | | | | | |
| ON(4) | | | | | | | | |
| ON(5) | | | | | | | | |
| Total ON | 4 | 36.4 | 2 | 15.4 | 2 | 18.2 | - | - |
| IntroP | 4 | 36.4 | 5 | 38.5 | 1 | 9.1 | 1½ | 21.4 |
| ExtraP(1) | 2 | 18.2 | 3 | 23.1 | 2 | 18.2 | 3½ | 50.0 |
| ExtraP(2) | | | | | | | | |
| ExtraP(3) | | | | | | | | |
| Imp | | | 2 | 15.4 | | | | |
| Total RO | 6 | 54.5 | 10 | 76.9 | 3 | 27.3 | 5 | 71.4 |
| OD | 4 | 36.4 | 7 | 53.8 | 3 | 27.3 | 1 | 14.3 |
| OD(1) | | | | | | | | |
| OD(2) | | | | | | | | |
| OD(3) | | | | | | | | |
| OD(4) | | | | | | | | |
| OD(5) | | | 1 | 7.7 | | | 1 | 14.3 |
| OD(6) | | | | | | | | |
| OD(7) | 3 | 27.3 | 2 | 15.4 | | | | |
| Total OD | 7 | 63.6 | 10 | 76.9 | 3 | 27.3 | 2 | 28.6 |
| IntroP | 3 | 27.3 | 2 | 15.4 | 6 | 54.4 | 3 | 42.9 |
| ExtraP(1) | | | | | | | 1 | 14.3 |
| ExtraP(2) | | | | | | | | |
| MultiP | | | | | | | | |
| Total RS | 3 | 27.3 | 2 | 15.4 | 6 | 54.5 | 4 | 57.2 |
| NP(S-1) | | | | | 1 | 9.1 | | |
| S-1 | 3 | 27.3 | 2 | 15.4 | 6 | 54.5 | 4 | 57.2 |
| S-2 | | | 1 | 7.7 | | | 1 | 14.3 |
| S-3 | | | | | | | | |
| S-3/1 | | | | | | | | |
| S-4 | | | | | | | | |
| Total NP | 3 | 27.3 | 3 | 23.1 | 7 | 63.6 | 5 | 71.4 |

FREQUENCY OF OCCURRENCE OF RESPONSE TYPES
BY PROFESSIONAL EDUCATION FOR CARTOON NO. 6

(expressed as aggregates and as percentages of the total sample)

| Response Type \ Profession | Agriculture | | Forestry | | Geography | | Biological Sciences | |
|-------------------------------|-------------|-------|----------|------|-----------|-------|------------------------|-------|
| | # | % | # | % | # | % | # | % |
| ON(1) | 9 | 81.8 | 7 | 53.8 | 4 | 36.4 | 1 | 16.7 |
| ON(2) | | | | | | | | |
| ON(3) | 2 | 18.2 | 1 | 7.7 | 8 | 72.7 | 6 | 100.0 |
| ON(4) | | | | | | | | |
| ON(5) | | | | | | | | |
| Total ON | 11 | 100.0 | 8 | 61.5 | 12 | 109.1 | 7 | 116.7 |
| IntroP | | | | | | | | |
| ExtraP(1) | 1 | 9.1 | 1 | 7.7 | | | | |
| ExtraP(2) | 9 | 81.8 | 7 | 53.8 | 4 | 36.4 | 1 | 16.7 |
| ExtraP(3) | | | | | | | | |
| Imp | | | | | | | | |
| Total RO | 10 | 90.9 | 8 | 61.5 | 4 | 36.4 | 1 | 16.7 |
| OD | 7 | 63.6 | 6 | 46.1 | 1 | 9.1 | 1 | 16.7 |
| OD(1) | 2 | 18.2 | 2 | 15.4 | 1 | 9.1 | 1 | 16.7 |
| OD(2) | | | | | | | | |
| OD(3) | | | 1 | 7.7 | | | | |
| OD(4) | | | | | | | | |
| OD(5) | | | 1 | 7.7 | | | | |
| OD(6) | | | | | | | | |
| OD(7) | | | | | | | | |
| Total OD | 9 | 81.8 | 10 | 76.9 | 2 | 18.2 | 2 | 33.3 |
| IntroP | 3 | 27.3 | 4 | 30.8 | 5 | 45.5 | 1 | 16.7 |
| ExtraP(1) | | | | | | | | |
| ExtraP(2) | | | | | | | | |
| MultiP | | | | | | | | |
| Total RS | 3 | 27.3 | 4 | 30.8 | 5 | 45.5 | 1 | 16.7 |
| NP(S-1) | | | 1 | 7.7 | | | | |
| S-1 | 2 | 18.2 | 2 | 15.4 | 5 | 45.5 | 1 | 16.7 |
| S-2 | 2 | 18.2 | | | | | | |
| S-3 | | | 1 | 7.7 | | | | |
| S-3/1 | | | | | | | | |
| S-4 | | | | | | | | |
| Total NP | 4 | 36.4 | 4 | 30.8 | 5 | 45.5 | 1 | 16.7 |

FREQUENCY OF OCCURRENCE OF RESPONSE TYPES
BY PROFESSIONAL EDUCATION FOR CARTOON NO. 7

(expressed as aggregates and as percentages of the total sample)

| Profession Response Type | Agriculture | | Forestry | | Geography | | Biological Sciences | |
|--------------------------------|-------------|------|----------------|------|----------------|------|------------------------|------|
| | # | % | # | % | # | % | # | % |
| ON(1) | | | 3 | 23.1 | 1 | 9.1 | | |
| ON(2) | 1 | 9.1 | | | | | 1 | 14.3 |
| ON(3) | | | | | | | | |
| ON(4) | | | | | | | | |
| ON(5) | | | | | | | | |
| Total ON | 1 | 9.1 | 3 | 23.1 | 1 | 9.1 | 1 | 14.3 |
| IntroP | | | $\frac{1}{2}$ | 3.8 | | | | |
| ExtraP(1) | 4 | 36.4 | 5 | 38.5 | $3\frac{1}{2}$ | 31.8 | 2 | 28.6 |
| ExtraP(2) | 1 | 9.1 | $1\frac{1}{2}$ | 11.5 | $\frac{1}{2}$ | 4.5 | | |
| ExtraP(3) | | | | | | | | |
| Imp | | | | | | | | |
| Total RO | 5 | 45.5 | 8 | 61.5 | 4 | 36.4 | 2 | 28.6 |
| OD | | | 5 | 38.5 | 3 | 27.3 | 1 | 14.3 |
| OD(1) | | | | | | | | |
| OD(2) | | | | | | | 1 | 14.3 |
| OD(3) | | | | | | | | |
| OD(4) | | | | | | | | |
| OD(5) | | | | | | | | |
| OD(6) | | | | | 2 | 18.2 | 1 | 14.3 |
| OD(7) | | | | | | | | |
| Total OD | - | - | 5 | 38.5 | 5 | 45.5 | 3 | 42.9 |
| IntroP | 3 | 27.3 | 2 | 15.4 | 3 | 27.3 | | |
| ExtraP(1) | 4 | 36.4 | 3 | 23.1 | 2 | 18.2 | 2 | 28.6 |
| ExtraP(2) | | | | | | | | |
| MultiP | | | 1 | 7.7 | | | | |
| Total RS | 7 | 63.6 | 6 | 46.1 | 5 | 45.5 | 2 | 28.6 |
| NP(S-1) | 3 | 27.3 | | | | | 1 | 14.3 |
| S-1 | 7 | 63.6 | 5 | 38.5 | 4 | 36.4 | 2 | 28.6 |
| S-2 | | | | | | | | |
| S-3 | | | 2 | 15.4 | | | | |
| S-3/1 | | | | | 2 | 18.2 | | |
| S-4 | | | | | | | | |
| Total NP | 10 | 90.9 | 7 | 53.8 | 6 | 54.5 | 3 | 42.9 |

FREQUENCY OF OCCURRENCE OF RESPONSE TYPES
BY PROFESSIONAL EDUCATION FOR CARTOON NO. 12

(expressed as aggregates and as percentages of the total sample)

| Response Type \ Profession | Agriculture | | Forestry | | Geography | | Biological Sciences | |
|-------------------------------|-------------|------|----------|------|-----------|------|------------------------|-------|
| | # | % | # | % | # | % | # | % |
| ON(1) | | | 3 | 23.1 | 1 | 11.1 | 2 | 28.6 |
| ON(2) | 2 | 20.0 | 1 | 7.7 | 1 | 11.1 | | |
| ON(3) | 1 | 10.0 | | | | | | |
| ON(4) | | | | | | | | |
| ON(5) | | | | | | | | |
| Total ON | 3 | 30.0 | 4 | 30.8 | 2 | 22.2 | 2 | 28.6 |
| IntroP | | | 1 | 7.7 | 2 | 22.2 | 1 | 14.3 |
| ExtraP(1) | | | | | | | | |
| ExtraP(2) | | | | | | | | |
| ExtraP(3) | | | | | | | | |
| Imp | | | 1 | 7.7 | | | | |
| Total RO | - | - | 2 | 15.4 | 2 | 22.2 | 1 | 14.3 |
| OD | 2 | 20.0 | 6 | 46.1 | 6 | 66.7 | 1 | 14.3 |
| OD(1) | | | 2 | 15.4 | 1 | 11.1 | 1 | 14.3 |
| OD(2) | | | | | | | | |
| OD(3) | 1 | 10.0 | 2 | 15.4 | | | 1 | 28.6 |
| OD(4) | | | | | | | | |
| OD(5) | | | | | | | | |
| OD(6) | | | | | | | 3 | 42.9 |
| OD(7) | | | | | | | 1 | 14.3 |
| Total OD | 3 | 30.0 | 10 | 76.9 | 7 | 77.7 | 7 | 100.0 |
| IntroP | 4 | 40.0 | 1 | 7.7 | 2 | 22.2 | | |
| ExtraP(1) | 1 | 10.0 | | | | | | |
| ExtraP(2) | | | | | | | | |
| MultiP | | | | | | | | |
| Total RS | 5 | 50.0 | 1 | 7.7 | 2 | 22.2 | - | - |
| NP(S-1) | 1 | 10.0 | 3 | 23.1 | 2 | 22.2 | 1 | 14.3 |
| S-1 | 4 | 40.0 | 1 | 7.7 | 1 | 11.1 | | |
| S-2 | | | | | | | | |
| S-3 | | | | | | | | |
| S-3/1 | | | | | | | | |
| S-4 | | | | | | | | |
| Total NP | 5 | 50.0 | 4 | 30.8 | 3 | 33.3 | 1 | 14.3 |

FREQUENCY OF OCCURRENCE OF RESPONSE TYPES
BY PROFESSIONAL EDUCATION FOR CARTOON NO. 13

(expressed as aggregates and as percentages of the total sample)

| Profession Response Type | Agriculture | | Forestry | | Geography | | Biological Sciences | |
|--------------------------------|-------------|------|----------|-------|-----------|-------|------------------------|-------|
| | # | % | # | % | # | % | # | % |
| ON(1) | 4 | 36.4 | 9 | 75.0 | 7 | 63.6 | 5 | 71.5 |
| ON(2) | 1 | 9.1 | | | | | | |
| ON(3) | | | 3 | 25.0 | 5 | 45.5 | 2 | 28.6 |
| ON(4) | | | | | | | | |
| ON(5) | | | | | | | | |
| Total ON | 5 | 45.5 | 12 | 100.0 | 12 | 109.1 | 7 | 100.0 |
| IntroP | | | | | | | | |
| ExtraP(1) | 1 | 9.1 | | | | | | |
| ExtraP(2) | | | 2 | 16.7 | | | | |
| ExtraP(3) | | | | | | | | |
| Imp | | | | | | | | |
| Total RO | 1 | 9.1 | 2 | 16.7 | - | - | - | - |
| OD | 5 | 45.5 | 5 | 41.7 | 3 | 27.3 | 1 | 14.3 |
| OD(1) | | | | | 1 | 9.1 | 2 | 28.6 |
| OD(2) | 1 | 9.1 | 1 | 8.3 | | | 1 | 14.3 |
| OD(3) | 1 | 9.1 | | | | | | |
| OD(4) | | | | | | | | |
| OD(5) | 2 | 18.2 | | | 2 | 18.2 | 1 | 14.3 |
| OD(6) | | | | | | | 1 | 14.3 |
| OD(7) | | | | | | | | |
| Total OD | 9 | 81.8 | 6 | 50.0 | 6 | 54.5 | 6 | 83.7 |
| IntroP | | | 1 | 8.3 | 1 | 9.1 | | |
| ExtraP(1) | 1 | 9.1 | | | | | | |
| ExtraP(2) | | | 1 | 8.3 | | | | |
| MultiP | 1 | 9.1 | | | | | | |
| Total RS | 2 | 18.2 | 2 | 16.7 | 1 | 9.1 | - | - |
| NP(S-1) | | | | | 1 | 9.1 | 1 | 14.3 |
| S-1 | 2 | 18.2 | 2 | 16.7 | 1 | 9.1 | | |
| S-2 | | | | | | | | |
| S-3 | | | | | | | | |
| S-3/1 | | | | | | | | |
| S-4 | | | | | | | | |
| Total NP | 2 | 18.2 | 2 | 16.7 | 2 | 18.2 | 1 | 14.3 |

FREQUENCY OF OCCURRENCE OF RESPONSE TYPES
BY PROFESSIONAL EDUCATION FOR CARTOON NO. 14

(expressed as aggregates and as percentages of the total sample)

| Response Type \ Profession | Agriculture | | Forestry | | Geography | | Biological Sciences | |
|-------------------------------|-------------|------|----------|------|-----------|------|------------------------|-------|
| | # | % | # | % | # | % | # | % |
| ON(1) | 1 | 9.1 | 2 | 16.7 | | | | |
| ON(2) | 1 | 9.1 | 1 | 8.3 | 1 | 10.0 | | |
| ON(3) | | | | | | | | |
| ON(4) | | | | | | | | |
| ON(5) | | | | | | | | |
| Total ON | 2 | 18.2 | 3 | 25.0 | 1 | 10.0 | - | - |
| IntroP | | | | | 1 | 10.0 | | |
| ExtraP(1) | 3 | 27.3 | 2 | 16.7 | 2 | 20.0 | 2 | 28.6 |
| ExtraP(2) | | | | | | | | |
| ExtraP(3) | | | | | | | | |
| Imp | | | 1 | 8.3 | | | | |
| Total RO | 3 | 27.3 | 3 | 25.0 | 3 | 30.0 | 2 | 28.6 |
| OD | 1 | 9.1 | 3 | 25.0 | 3 | 30.0 | | |
| OD(1) | | | | | | | | |
| OD(2) | | | | | | | 1 | 14.3 |
| OD(3) | | | | | | | | |
| OD(4) | | | | | | | | |
| OD(5) | | | 1 | 8.3 | | | | |
| OD(6) | | | 1 | 8.3 | 1 | 10.0 | 1 | 14.3 |
| OD(7) | 1 | 9.1 | | | | | | |
| Total OD | 2 | 18.2 | 5 | 41.7 | 4 | 40.0 | 2 | 28.6 |
| IntroP | 5 | 45.5 | 3 | 25.0 | 2 | 20.0 | 2 | 28.6 |
| ExtraP(1) | 1 | 9.1 | | | 1 | 10.0 | 1 | 14.3 |
| ExtraP(2) | | | 1 | 8.3 | | | | |
| MultiP | | | | | | | | |
| Total RS | 6 | 54.5 | 4 | 33.3 | 3 | 30.0 | 3 | 42.9 |
| NP(S-1) | 1 | 9.1 | 3 | 25.0 | 1 | 10.0 | 1 | 14.3 |
| S-1 | 5 | 45.5 | 3 | 25.0 | 5 | 50.0 | 3 | 42.9 |
| S-2 | 1 | 9.1 | 1 | 8.3 | | | | |
| S-3 | | | 1 | 8.3 | | | 1 | 14.3 |
| S-3/1 | | | | | | | | |
| S-4 | 1 | 9.1 | | | | | 1 | 14.3 |
| Total NP | 8 | 72.7 | 8 | 67.7 | 6 | 60.0 | 9 | 128.6 |

FREQUENCY OF OCCURRENCE OF RESPONSE TYPES
BY PROFESSIONAL EDUCATION FOR CARTOON NO. 15

(expressed as aggregates and as percentages of the total sample)

| Response Type \ Profession | Agriculture | | Forestry | | Geography | | Biological Sciences | |
|-------------------------------|-------------|-------|----------|------|-----------|------|------------------------|------|
| | # | % | # | % | # | % | # | % |
| ON(1) | 1 | 9.1 | 4 | 33.3 | 1 | 10.0 | 1 | 14.3 |
| ON(2) | | | 1 | 8.3 | | | 2 | 28.6 |
| ON(3) | | | | | | | | |
| ON(4) | | | | | | | | |
| ON(5) | | | | | | | | |
| Total ON | 1 | 9.1 | 5 | 41.7 | 1 | 10.0 | 3 | 42.9 |
| IntroP | | | 1 | 8.3 | | | | |
| ExtraP(1) | 9½ | 86.3 | 4 | 33.3 | 5½ | 55.0 | 4 | 57.2 |
| ExtraP(2) | ½ | 4.5 | | | 1½ | 15.0 | 1 | 14.3 |
| ExtraP(3) | 1 | 9.1 | 3 | 25.0 | | | 1 | 14.3 |
| Imp | 1 | 9.1 | 1 | 8.3 | 1 | 10.0 | | |
| Total RO | 12 | 109.1 | 9 | 75.0 | 8 | 80.0 | 6 | 85.8 |
| OD | 3 | 27.3 | 3 | 25.0 | 4 | 40.0 | 1 | 14.3 |
| OD(1) | | | | | | | | |
| OD(2) | | | | | | | | |
| OD(3) | | | | | | | | |
| OD(4) | | | | | | | | |
| OD(5) | | | | | | | | |
| OD(6) | | | | | | | | |
| OD(7) | | | | | | | | |
| Total OD | 3 | 27.3 | 3 | 25.0 | 4 | 40.0 | 1 | 14.3 |
| IntroP | 3 | 27.3 | | | 2 | 20.0 | 1 | 14.3 |
| ExtraP(1) | 1 | 9.1 | 1 | 8.3 | | | 1 | 14.3 |
| ExtraP(2) | 2 | 18.2 | | | 1 | 10.0 | 1 | 14.3 |
| MultiP | | | 1 | 8.3 | 1 | 10.0 | | |
| Total RS | 6 | 54.5 | 5 | 41.7 | 8 | 80.0 | 4 | 57.2 |
| NP(S-1) | 2 | 18.2 | 3 | 25.0 | 1 | 10.0 | | |
| S-1 | 1 | 9.1 | 1 | 8.3 | 2 | 20.0 | 1 | 14.3 |
| S-2 | | | | | | | | |
| S-3 | | | 1 | 8.3 | 1 | 10.0 | | |
| S-3/1 | | | | | | | | |
| S-4 | 5 | 45.5 | 2 | 16.7 | 2 | 20.0 | 3 | 42.9 |
| Total NP | 8 | 72.7 | 7 | 58.3 | 6 | 60.0 | 4 | 57.2 |

FREQUENCY OF OCCURRENCE OF RESPONSE TYPES
BY PROFESSIONAL EDUCATION FOR CARTOON NO. 16

(expressed as aggregates and as percentages of the total sample)

| Profession Response Type | Agriculture | | Forestry | | Geography | | Biological Science | |
|--------------------------------|-------------|------|----------|------|-----------|------|-----------------------|------|
| | # | % | # | % | # | % | # | % |
| ON(1) | | | | | | | 1 | 14.3 |
| ON(2) | | | | | | | | |
| ON(3) | | | | | | | | |
| ON(4) | | | | | | | | |
| ON(5) | | | | | | | | |
| Total ON | - | - | - | - | - | - | 1 | 14.3 |
| IntroP | | | | | | | | |
| ExtraP(1) | 5 | 45.5 | 8 | 66.7 | 6 | 54.5 | 6 | 83.7 |
| ExtraP(2) | | | | | | | | |
| ExtraP(3) | | | | | | | | |
| Imp | | | | | 1 | 9.1 | | |
| Total RO | 5 | 45.5 | 8 | 66.7 | 7 | 63.6 | 6 | 83.7 |
| OD | 3 | 27.3 | 3 | 66.7 | 3 | 27.3 | 3 | 42.9 |
| OD(1) | | | | | | | | |
| OD(2) | | | | | | | | |
| OD(3) | | | | | | | | |
| OD(4) | | | | | | | | |
| OD(5) | 1 | 9.1 | | | | | | |
| OD(6) | | | | | | | | |
| OD(7) | | | | | | | | |
| Total OD | 4 | 36.4 | 8 | 66.7 | 3 | 27.3 | 3 | 42.9 |
| IntroP | 6 | 54.5 | 4 | 33.3 | 4 | 36.4 | 1 | 14.3 |
| ExtraP(1) | 1 | 9.1 | 1 | 8.3 | | | 1 | 14.3 |
| ExtraP(2) | | | | | | | | |
| MultiP | | | | | | | | |
| Total RS | 7 | 63.6 | 5 | 41.7 | 4 | 36.4 | 2 | 28.6 |
| NP(S-1) | 1 | 9.1 | 2 | 16.7 | 1 | 9.1 | 2 | 28.6 |
| S-1 | 5 | 45.5 | 2 | 16.7 | 5 | 45.5 | 1 | 14.3 |
| S-2 | | | 1 | 8.3 | 1 | 9.1 | 1 | 14.3 |
| S-3 | | | | | 1 | 9.1 | | |
| S-3/1 | | | | | | | | |
| S-4 | 2 | 18.2 | | | 2 | 18.2 | 1 | 14.3 |
| Total NP | 8 | 72.7 | 5 | 41.7 | 10 | 90.9 | 5 | 71.5 |

FREQUENCY OF OCCURRENCE OF RESPONSE TYPES
BY PROFESSIONAL EDUCATION FOR CARTOON NO. 17

(expressed as aggregates and as percentages of the total sample)

| Response Type \ Profession | Agriculture | | Forestry | | Geography | | Biological Sciences | |
|-------------------------------|-------------|------|----------|------|-----------|------|------------------------|------|
| | # | % | # | % | # | % | # | % |
| ON(1) | | | 4 | 30.8 | | | 1 | 14.3 |
| ON(2) | 2 | 18.2 | 1 | 7.7 | | | 2 | 28.6 |
| ON(3) | 1 | 9.1 | | | | | | |
| ON(4) | | | | | | | | |
| ON(5) | | | | | | | | |
| Total ON | 3 | 27.3 | 5 | 38.5 | - | - | 3 | 42.9 |
| IntroP | | | | | | | | |
| ExtraP(1) | | | 2 | 15.4 | | | 2 | 28.6 |
| ExtraP(2) | | | 4 | 30.8 | 3 | 27.3 | 1 | 14.3 |
| ExtraP(3) | | | 1 | 7.7 | | | 1 | 14.3 |
| Imp | | | | | | | | |
| Total RO | - | - | 7 | 53.8 | 3 | 27.3 | 4 | 57.1 |
| OD | 2 | 18.2 | 6 | 46.1 | 4 | 36.4 | | |
| OD(1) | | | | | | | | |
| OD(2) | | | | | | | | |
| OD(3) | | | | | | | | |
| OD(4) | | | | | | | | |
| OD(5) | | | | | | | | |
| OD(6) | | | | | | | 1 | 14.3 |
| OD(7) | | | | | | | | |
| Total OD | 2 | 18.2 | 6 | 46.1 | 4 | 36.4 | 1 | 14.3 |
| IntroP | 4 | 36.4 | 6 | 46.1 | 7 | 63.6 | 5 | 71.5 |
| ExtraP(1) | | | | | | | | |
| ExtraP(2) | | | | | | | | |
| MultiP | | | | | | | | |
| Total RS | 4 | 36.4 | 6 | 46.1 | 7 | 63.6 | 5 | 71.5 |
| NP(S-1) | 3 | 27.3 | | | | | | |
| S-1 | 2 | 18.2 | 4 | 30.8 | 4 | 36.4 | 1 | 14.3 |
| S-2 | | | | | | | | |
| S-3 | 1 | 9.1 | 3 | 23.1 | 4 | 36.4 | 4 | 57.2 |
| S-3/1 | | | | | | | | |
| S-4 | | | | | | | | |
| Total NP | 6 | 54.5 | 7 | 53.8 | 8 | 72.7 | 5 | 71.5 |

FREQUENCY OF OCCURRENCE OF RESPONSE TYPES
BY PROFESSIONAL EDUCATION FOR CARTOON NO. 19

(expressed as aggregates and as percentages of the total sample)

| Response Type \ Profession | Agriculture | | Forestry | | Geography | | Biological Sciences | |
|-------------------------------|-------------|------|----------|------|-----------|------|------------------------|------|
| | # | % | # | % | # | % | # | % |
| ON(1) | 3 | 30.0 | 6 | 50.0 | 4 | 36.4 | 2 | 28.6 |
| ON(2) | 2 | 20.0 | 2 | 16.7 | 2 | 18.2 | | |
| ON(3) | | | | | | | | |
| ON(4) | | | | | | | | |
| ON(5) | | | | | | | | |
| Total ON | 5 | 50.0 | 8 | 66.7 | 6 | 54.5 | 2 | 28.6 |
| IntroP | 1 | 10.0 | 1½ | 12.5 | 1 | 9.1 | 1 | 14.3 |
| ExtraP(1) | | | ½ | 4.2 | 1 | 9.1 | | |
| ExtraP(2) | | | | | | | 1 | 14.3 |
| ExtraP(3) | | | 3 | 25.0 | | | | |
| Imp | 4 | 40.0 | | | 1 | 9.1 | 1 | 14.3 |
| Total RO | 5 | 50.0 | 5 | 41.7 | 3 | 27.3 | 3 | 42.9 |
| OD | 4 | 40.0 | 8 | 66.7 | 5 | 45.5 | 4 | 57.2 |
| OD(1) | 1 | 10.0 | 1 | 8.3 | | | 1 | 14.3 |
| OD(2) | | | | | | | | |
| OD(3) | | | | | | | | |
| OD(4) | | | | | | | | |
| OD(5) | | | | | | | | |
| OD(6) | | | | | | | | |
| OD(7) | | | | | | | | |
| Total OD | 5 | 50.0 | 9 | 75.0 | 5 | 45.5 | 5 | 71.5 |
| IntroP | 3 | 30.0 | | | 3 | 27.3 | 2 | 28.6 |
| ExtraP(1) | | | | | | | | |
| ExtraP(2) | | | | | | | | |
| MultiP | | | | | | | | |
| Total RS | 3 | 30.0 | - | - | 3 | 27.3 | 2 | 28.6 |
| NP(S-1) | 1 | 10.0 | 1 | 8.3 | | | | |
| S-1 | 2 | 20.0 | | | 2 | 18.2 | 2 | 28.6 |
| S-2 | | | | | | | | |
| S-3 | | | | | 1 | 9.1 | | |
| S-3/1 | | | | | 1 | 9.1 | | |
| S-4 | | | | | | | | |
| Total NP | 3 | 30.0 | 1 | 8.3 | 4 | 36.4 | 2 | 28.6 |

FREQUENCY OF OCCURRENCE OF RESPONSE TYPES Appendix E
BY AGENCIES FOR CARTOON NO. 1

(expressed as percentages of the total sample with sample size indicated in brackets)

| Agency Response Type | TM (7) | FLU (8) | MLU (7) | Lands (6) | F&W (6) | Parks (7) | IPD (4) | WR (5) | PP (5) |
|----------------------------|-----------|------------|------------|--------------|------------|--------------|------------|-----------|-----------|
| ON(1) | 14.3 | | | 16.7 | | | | | |
| ON(2) | | | | | 16.7 | | | | |
| ON(3) | 14.3 | | 28.6 | 16.7 | | 16.7 | | | |
| ON(4) | 14.3 | | | | | | | | |
| ON(5) | 14.3 | | 14.3 | 16.7 | 33.3 | | | | |
| Total ON | 57.1 | - | 42.8 | 50.0 | 33.3 | 16.7 | - | - | - |
| IntroP | | | | | | | | | |
| ExtraP(1) | | | | | | | | | |
| ExtraP(2) | | | | | | | | | |
| ExtraP(3) | | | | | | | | | |
| Imp | | | | | | | | | |
| Total RO | - | - | - | - | - | - | - | - | - |
| OD | | | | | | | | | |
| OD(1) | 42.8 | 87.5 | 57.1 | 16.7 | 66.7 | 66.7 | 100.0 | 80.0 | 30.0 |
| OD(2) | | 12.5 | | 16.7 | 16.7 | | | | |
| OD(3) | | | | | | | | | |
| OD(4) | | | | | | | | | |
| OD(5) | | | | | | | | | |
| OD(6) | | | | | 33.3 | 50.0 | | 20.0 | 30.0 |
| OD(7) | | | | | | | | | |
| Total OD | 42.8 | 100.0 | 57.1 | 33.3 | 116.7 | 116.7 | 100.0 | 100.0 | 60.0 |
| IntroP | | | | 16.7 | | | | | |
| ExtraP(1) | | | | | | | | | |
| ExtraP(2) | | | | | | | | | |
| MultiP | | | | | | | | | |
| Total RS | - | - | - | 16.7 | - | - | - | - | - |
| NP(S-1) | 28.6 | 25.0 | 14.3 | 16.7 | | 33.3 | | 40.0 | |
| S-1 | 28.6 | 12.5 | 28.6 | 33.3 | | | | | 10.0 |
| S-2 | | | | | | | | | |
| S-3 | | | | | | | | | |
| S-3/1 | 14.3 | | | | | | | | |
| S-4 | | | | | | | | | |
| Total NP | 71.4 | 37.5 | 42.8 | 50.0 | - | 33.3 | - | 40.0 | 10.0 |

FREQUENCY OF OCCURRENCE OF RESPONSE TYPES
BY AGENCIES FOR CARTOON NO. 4

(expressed as percentages of the total sample with sample size indicated in brackets)

| Agency Response Type | TM (7) | FLU (8) | MLU (7) | Lands (6) | F&W (6) | Parks (7) | IPD (5) | WR (5) | PP (5) |
|----------------------------|-----------|------------|------------|--------------|------------|--------------|------------|-----------|-----------|
| ON(1) | | | 14.3 | 16.7 | | | 20.0 | 20.0 | 20.0 |
| ON(2) | | 12.5 | 28.6 | | | 28.6 | | 20.0 | |
| ON(3) | | 12.5 | | 16.7 | | | 20.0 | | |
| ON(4) | | | | | | | | | |
| ON(5) | | | 14.3 | | | | | | |
| Total ON | - | 25.0 | 57.1 | 33.3 | - | 28.6 | 40.0 | 40.0 | 20.0 |
| IntroP | 14.3 | | | | 66.7 | | | | |
| ExtraP(1) | 42.8 | 50.0 | 28.6 | 16.7 | | 28.6 | 40.0 | 40.0 | 40.0 |
| ExtraP(2) | | 12.5 | | 16.7 | 16.7 | | 20.0 | 20.0 | |
| ExtraP(3) | | | | | | | | | |
| Imp | | | | 16.7 | | | | | |
| Total RO | 57.1 | 62.5 | 28.6 | 50.0 | 83.3 | 28.6 | 60.0 | 60.0 | 40.0 |
| OD | 14.3 | 12.5 | | 16.7 | 16.7 | 14.3 | 20.0 | 20.0 | 20.0 |
| OD(1) | 14.3 | | | 16.7 | 16.7 | 14.3 | | | |
| OD(2) | | | | | | 14.3 | | | |
| OD(3) | | | | | | | | | |
| OD(4) | | 12.5 | | 16.7 | | | | 20.0 | |
| OD(5) | | | | | | | | | |
| OD(6) | 14.3 | | | | | | | 20.0 | |
| OD(7) | | | | | | | | | |
| Total OD | 42.8 | 25.0 | - | 50.0 | 33.3 | 42.8 | 20.0 | 60.0 | 20.0 |
| IntroP | 14.3 | 37.5 | 57.1 | 33.3 | 16.7 | 28.6 | 60.0 | 20.0 | 80.0 |
| ExtraP(1) | | | | | | | 20.0 | | |
| ExtraP(2) | | | | | | | | | |
| MultiP | 28.6 | | 14.3 | | | | | | |
| Total RS | 42.8 | 37.5 | 71.4 | 33.3 | 16.7 | 28.6 | 80.0 | 20.0 | 80.0 |
| NP(S-1) | 28.6 | | | | 16.7 | 14.3 | | | |
| S-1 | 14.3 | 12.5 | 14.3 | 16.7 | | | 20.0 | | |
| S-2 | | | | | | | | | |
| S-3 | 14.3 | 25.0 | 28.6 | | | 14.3 | 20.0 | 20.0 | 20.0 |
| S-3/1 | | 12.5 | 28.6 | 16.7 | | | | | 20.0 |
| S-4 | | 12.5 | | | 66.7 | 14.3 | 40.0 | 20.0 | 60.0 |
| Total NP | 57.1 | 62.5 | 71.4 | 33.3 | 83.3 | 42.8 | 80.0 | 40.0 | 100.0 |

FREQUENCY OF OCCURRENCE OF RESPONSE TYPES
BY AGENCIES FOR CARTOON NO. 5

(expressed as percentages of the total sample with sample size indicated in brackets)

| Agency Response Type | TM (7) | FLU (8) | MLU (7) | Lands (6) | F&W (6) | Parks (7) | IPD (5) | WR (5) | PP (5) |
|----------------------------|-----------|------------|------------|--------------|------------|--------------|------------|-----------|-----------|
| ON(1) | 14.3 | 12.5 | 14.3 | 33.3 | 16.7 | 14.3 | 40.0 | 40.0 | |
| ON(2) | | 12.5 | | | | 14.3 | | | |
| ON(3) | | | | | | | | | |
| ON(4) | | | | | | | | | |
| ON(5) | | | | | | | | | |
| Total ON | 14.3 | 25.0 | 14.3 | 33.3 | 16.7 | 28.6 | 40.0 | 40.0 | - |
| IntroP | 42.8 | 12.5 | 14.3 | 33.3 | 16.7 | 14.3 | 20.0 | 30.0 | |
| ExtraP(1) | 28.6 | | 28.6 | | 33.3 | 14.3 | 40.0 | 30.0 | |
| ExtraP(2) | | | | | | | | | |
| ExtraP(3) | | | | | | | | | |
| Imp | 14.3 | 37.5 | | | | | 20.0 | | |
| Total RO | 85.7 | 50.0 | 42.8 | 33.3 | 50.0 | 28.6 | 80.0 | 60.0 | - |
| OD | 71.4 | 62.5 | 14.3 | | 16.7 | 28.6 | 60.0 | 40.0 | |
| OD(1) | | | | | | | | | |
| OD(2) | | | | | | | | | |
| OD(3) | | | | | | | | | |
| OD(4) | | | | | | | | | |
| OD(5) | | | 14.3 | | | 14.3 | | | |
| OD(6) | | | | | | | | | |
| OD(7) | 14.3 | | 14.3 | 33.3 | 16.7 | | 40.0 | 20.0 | |
| Total OD | 85.7 | 62.5 | 42.8 | 33.3 | 33.3 | 42.8 | 100.0 | 60.0 | - |
| IntroP | | 25.0 | 57.1 | 50.0 | 50.0 | 28.6 | | 40.0 | 80.0 |
| ExtraP(1) | | | | | 16.7 | | | 20.0 | |
| ExtraP(2) | | | | | | | | | |
| MultiP | | | | 16.7 | | 14.3 | | | |
| Total RS | - | 25.0 | 57.1 | 66.7 | 66.7 | 42.8 | - | 60.0 | 80.0 |
| NP(S-1) | | 25.0 | | | | | | | 20.0 |
| S-1 | 14.3 | | 28.6 | 66.7 | 83.3 | 42.8 | | 40.0 | 80.0 |
| S-2 | | | 14.3 | | | | | | |
| S-3 | | | | | | | | | |
| S-3/1 | | | | | | | | | |
| S-4 | | | | | | | | | |
| Total NP | 14.3 | 25.0 | 42.8 | 66.7 | 83.3 | 42.8 | - | 40.0 | 100.0 |

FREQUENCY OF OCCURRENCE OF RESPONSE TYPES
BY AGENCIES FOR CARTOON NO. 6

(expressed as percentages of the total sample with sample size indicated in brackets)

| Agency Response Type | TM (7) | FLU (8) | MLU (7) | Lands (6) | F&W (6) | Parks (7) | IPD (5) | WR (5) | PP (5) |
|----------------------------|-----------|------------|------------|--------------|------------|--------------|------------|-----------|-----------|
| ON(1) | 57.1 | 25.0 | 57.1 | 83.3 | 83.3 | 28.6 | 100.0 | 40.0 | 60.0 |
| ON(2) | | | | | | 14.3 | | | |
| ON(3) | 14.3 | 12.5 | 57.1 | 33.3 | 16.7 | 28.6 | | 80.0 | 20.0 |
| ON(4) | | | | | | | | | |
| ON(5) | | | | | | | | | |
| Total ON | 71.4 | 37.5 | 114.3 | 116.7 | 100.0 | 71.4 | 100.0 | 120.0 | 80.0 |
| IntroP | | | | | | | | | |
| ExtraP(1) | 14.3 | 12.5 | 7.1 | 83.3 | | 14.3 | | | |
| ExtraP(2) | 57.1 | 25.0 | 50.0 | | 16.7 | 28.6 | 100.0 | 40.0 | 60.0 |
| ExtraP(3) | | | | | | | | | |
| Imp | | | | | | | | | |
| Total RO | 71.4 | 37.5 | 57.1 | 83.3 | 16.7 | 42.8 | 100.0 | 40.0 | 140.0 |
| OD | 57.1 | 12.5 | 28.6 | 33.3 | 16.7 | 28.6 | 100.0 | | |
| OD(1) | 14.3 | 25.0 | 14.3 | 16.7 | 16.7 | | | | 20.0 |
| OD(2) | | | | | | | | | |
| OD(3) | | | | | | | | | |
| OD(4) | | | | | | | | | |
| OD(5) | | 12.5 | | | | | | | |
| OD(6) | | | | | | | | | |
| OD(7) | | | | | | | | | |
| Total OD | 71.4 | 50.0 | 42.8 | 50.0 | 33.3 | 28.6 | 100.0 | - | 20.0 |
| IntroP | 28.6 | 50.0 | 28.6 | 50.0 | 16.7 | 28.6 | | 20.0 | 100.0 |
| ExtraP(1) | | | | | | | | | |
| ExtraP(2) | | | | | | | | | |
| MultiP | | | | | | | | | |
| Total RS | 28.6 | 50.0 | 28.6 | 50.0 | 16.7 | 28.6 | - | 20.0 | 100.0 |
| NP(S-1) | | 12.5 | | | | | | | |
| S-1 | 14.3 | 37.5 | 28.6 | 50.0 | 16.7 | 28.6 | | 20.0 | 100.0 |
| S-2 | | 12.5 | | | | | | | |
| S-3 | 14.3 | | | | | 14.3 | | | |
| S-3/1 | | | | | | | | | |
| S-4 | | | | | | | | | |
| Total NP | 28.6 | 62.5 | 28.6 | 50.0 | 16.7 | 42.8 | - | 20.0 | 100.0 |

FREQUENCY OF OCCURRENCE OF RESPONSE TYPES
BY AGENCIES FOR CARTOON NO. 7

(expressed as percentages of the total sample with sample size indicated in brackets)

| Agency Response Type | TM (7) | FLU (8) | MLU (7) | Lands (6) | F&W (6) | Parks (6) | IPD (5) | WR (5) | PP (5) |
|----------------------------|-----------|------------|------------|--------------|------------|--------------|------------|-----------|-----------|
| ON(1) | 14.3 | 37.5 | | | | 16.7 | | | 20.0 |
| ON(2) | | | | 33.3 | | 50.0 | 20.0 | | |
| ON(3) | | | | | | | | | |
| ON(4) | | | | | | | | | |
| ON(5) | | | | | | | | | |
| Total ON | 14.3 | 37.5 | - | 33.3 | - | 66.7 | 20.0 | - | 20.0 |
| IntroP | | 6.3 | | | | | | | |
| ExtraP(1) | 35.7 | 31.3 | 42.8 | 16.7 | 16.7 | 8.3 | 40.0 | | 10.0 |
| ExtraP(2) | 7.1 | 12.5 | | 16.7 | | 8.3 | | 40.0 | 10.0 |
| ExtraP(3) | | | | | | | | | |
| Imp | | | | | | | | | |
| Total RO | 42.8 | 50.0 | 42.8 | 33.3 | 16.7 | 16.7 | 40.0 | 40.0 | 20.0 |
| OD | 57.1 | 25.0 | 14.3 | | 33.3 | 16.7 | | 40.0 | 20.0 |
| OD(1) | | | | | | | | | |
| OD(2) | | | | | | 16.7 | | | |
| OD(3) | | | | | | | | | |
| OD(4) | | | | | | | | | |
| OD(5) | | | | | | | | | |
| OD(6) | | 12.5 | 42.8 | | 33.3 | | | | |
| OD(7) | | | | | | | | | |
| Total OD | 57.1 | 37.5 | 57.1 | - | 66.7 | 33.3 | - | 40.0 | 20.0 |
| IntroP | 28.6 | | | 33.3 | | | 20.0 | | 60.0 |
| ExtraP(1) | 14.3 | 25.0 | 42.8 | 33.3 | 16.7 | 16.7 | 20.0 | 40.0 | |
| ExtraP(2) | | | | | | | | | |
| MultiP | | 12.5 | 14.3 | | | | | | |
| Total RS | 42.8 | 37.5 | 57.1 | 66.7 | 16.7 | 16.7 | 40.0 | 40.0 | 60.0 |
| NP(S-1) | | 12.5 | | | 33.3 | | 40.0 | 20.0 | 20.0 |
| S-1 | 28.6 | 37.5 | 57.1 | 66.7 | 16.7 | 16.7 | 40.0 | 40.0 | 20.0 |
| S-2 | | | | | | | | | |
| S-3 | 14.3 | 12.5 | | | | | | | |
| S-3/1 | | | | | | | | | 40.0 |
| S-4 | | | | | | | | | |
| Total NP | 42.8 | 62.5 | 57.1 | 66.7 | 50.0 | 16.7 | 80.0 | 60.0 | 80.0 |

FREQUENCY OF OCCURRENCE OF RESPONSE TYPES
BY AGENCIES FOR CARTOON NO. 12

(expressed as percentages of the total sample with sample size indicated in brackets)

| Agency Response Type | TM (7) | FLU (8) | MLU (7) | Lands (6) | F&W (7) | Parks (6) | IPD (5) | WR (3) | PP (5) |
|----------------------------|-----------|------------|------------|--------------|------------|--------------|------------|-----------|-----------|
| ON(1) | 14.3 | 25.0 | | | 28.6 | 33.3 | | 66.7 | |
| ON(2) | | 12.5 | 14.3 | | | | | | 20.0 |
| ON(3) | | | | 16.7 | | | | | |
| ON(4) | | | | | | | | | |
| ON(5) | | | | | | | | | |
| Total ON | 14.3 | 37.5 | 14.3 | 16.7 | 28.6 | 33.3 | - | - | 20.0 |
| IntroP | 14.3 | | 14.3 | | | | | 33.3 | |
| ExtraP(1) | | | | | | | | | |
| ExtraP(2) | | | | | | | | | |
| ExtraP(3) | | | | | | | | | |
| Imp | | | | | | | | | |
| Total RO | 14.3 | - | 14.3 | - | - | - | - | 33.3 | - |
| OD | 57.1 | 37.5 | 57.1 | 33.3 | 14.3 | 50.0 | 20.0 | 100.0 | 20.0 |
| OD(1) | 14.3 | 12.5 | | | 14.3 | | | | 20.0 |
| OD(2) | | | | | | | | | |
| OD(3) | | 12.5 | | | 14.3 | | 40.0 | | |
| OD(4) | | | | | | | | | |
| OD(5) | | | | | | 16.7 | | | |
| OD(6) | | | | | 28.6 | 33.3 | | | 20.0 |
| OD(7) | | | 14.3 | | 14.3 | | 20.0 | | |
| Total OD | 71.4 | 67.5 | 71.4 | 33.3 | 85.7 | 50.0 | 80.0 | 100.0 | 60.0 |
| IntroP | 14.3 | | 14.3 | 50.0 | 14.3 | | | | 40.0 |
| ExtraP(1) | | | | | | | 20.0 | | |
| ExtraP(2) | | | | | | | | | |
| MultiP | | 12.5 | | 16.7 | | | | | |
| Total RS | 14.3 | 12.5 | 14.3 | 66.7 | 14.3 | - | 20.0 | - | 40.0 |
| NP(S-1) | 14.3 | 37.5 | 14.3 | 33.3 | | 16.7 | | | 20.0 |
| S-1 | 14.3 | 12.5 | 14.3 | 33.3 | 14.3 | | 20.0 | | 20.0 |
| S-2 | | | | | | | | | |
| S-3 | | | | | | | | | |
| S-3/1 | | | | | | | | | |
| S-4 | | | | | | | | | |
| Total NP | 28.6 | 50.0 | 28.6 | 66.7 | 14.3 | 16.7 | 20.0 | - | 40.0 |

FREQUENCY OF OCCURRENCE OF RESPONSE TYPES
BY AGENCIES FOR CARTOON NO. 13

(expressed as percentages of the total sample with sample size indicated in brackets)

| Agency Response Type | TM (7) | FLU (7) | MLU (7) | Lands (6) | F&W (7) | Parks (6) | IPD (5) | WR (5) | PP (5) |
|----------------------------|-----------|------------|------------|--------------|------------|--------------|------------|-----------|-----------|
| ON(1) | 85.7 | 42.8 | 85.7 | 33.3 | 42.8 | 33.3 | 60.0 | 60.0 | 40.0 |
| ON(2) | | | | 16.7 | 28.6 | | | | 20.0 |
| ON(3) | 28.6 | 14.3 | 42.8 | 16.7 | 28.6 | | | 60.0 | |
| ON(4) | | | | | | | | | |
| ON(5) | | | | | | | | | |
| Total ON | 114.3 | 57.1 | 128.6 | 66.7 | 100.0 | 33.3 | 60.0 | 120.0 | 60.0 |
| IntroP | | | | | | 16.7 | | | 20.0 |
| ExtraP(1) | | | | 16.7 | | | | | |
| ExtraP(2) | 14.3 | 14.3 | | | | | | | |
| ExtraP(3) | | | | | | | | | |
| Imp | | | | | | | | | |
| Total RO | 14.3 | 14.3 | - | 16.7 | - | 16.7 | - | - | 20.0 |
| OD | 42.8 | 28.6 | 71.4 | 33.3 | 28.6 | 16.7 | 60.0 | 20.0 | 40.0 |
| OD(1) | | | 28.6 | | 14.3 | 16.7 | | 20.0 | |
| OD(2) | 14.3 | 28.6 | | | | | 20.0 | | |
| OD(3) | | | | 16.7 | | | | | |
| OD(4) | | | | | | | | | |
| OD(5) | | 28.6 | | 16.7 | 42.8 | 16.7 | 20.0 | 60.0 | |
| OD(6) | | | | | | 16.7 | | | |
| OD(7) | | | | | | | | | |
| Total OD | 57.1 | 85.7 | 100.0 | 66.7 | 85.7 | 57.1 | 100.0 | 100.0 | 40.0 |
| IntroP | 14.3 | 14.3 | | | | | | | 20.0 |
| ExtraP(1) | | | | | | 16.7 | | | |
| ExtraP(2) | | | | | | | | | |
| MultiP | | | | 16.7 | | | | | |
| Total RS | 14.3 | 14.3 | - | 16.7 | - | 71.4 | - | - | 20.0 |
| NP(S-1) | | | | | | 16.7 | | | 20.0 |
| S-1 | 14.3 | 14.3 | | 16.7 | 14.3 | 16.7 | | | 20.0 |
| S-2 | | | | | | | | | |
| S-3 | | | | | | 16.7 | | | |
| S-3/1 | | | | | | | | | |
| S-4 | | | | | | | | | |
| Total NP | 14.3 | 14.3 | - | 16.7 | 14.3 | 42.8 | - | - | 40.0 |

FREQUENCY OF OCCURRENCE OF RESPONSE TYPES
BY AGENCIES FOR CARTOON NO. 14

(expressed as percentages of the total sample with sample size indicated in brackets)

| Agency Response Type | TM (7) | FLU (8) | MLU (7) | Lands (6) | F&W (7) | Parks (7) | IPD (5) | WR (4) | PP (5) |
|----------------------------|-----------|------------|------------|--------------|------------|--------------|------------|-----------|-----------|
| ON(1) | 14.3 | 37.5 | 14.3 | 33.3 | | | | | |
| ON(2) | 14.3 | 12.5 | 14.3 | | | | | | |
| ON(3) | | | | | | | | | |
| ON(4) | | | | | | | | | |
| ON(5) | | | | | | | | | |
| Total ON | 28.6 | 50.0 | 28.6 | 33.3 | - | - | - | - | - |
| IntroP | | 12.5 | 14.3 | 33.3 | | | | | |
| ExtraP(1) | 14.3 | 12.5 | | 16.7 | 14.3 | | | 50.0 | |
| ExtraP(2) | | | 28.6 | | | | | | |
| ExtraP(3) | | | | | | 42.8 | 60.0 | | |
| Imp | | 25.0 | | | | | | | |
| Total RO | 14.3 | 50.0 | 42.8 | 50.0 | 14.3 | 42.8 | 60.0 | 50.0 | - |
| OD | 28.6 | 12.5 | 14.3 | | 28.6 | 14.3 | 40.0 | 25.0 | |
| OD(1) | | | | | | | | | |
| OD(2) | | | | | | 14.3 | | | |
| OD(3) | | | | | | | | | |
| OD(4) | | | | | | | | | |
| OD(5) | | 12.5 | | | | | | | |
| OD(6) | 14.3 | | | | 14.3 | | | 25.0 | |
| OD(7) | | 12.5 | | 16.7 | | | | | |
| Total OD | 42.8 | 37.5 | 14.3 | 16.7 | 42.8 | 28.6 | 40.0 | 50.0 | - |
| IntroP | | 37.5 | 28.6 | 50.0 | 14.3 | | 40.0 | 25.0 | 40.0 |
| ExtraP(1) | | | | | 14.3 | 14.3 | | 25.0 | |
| ExtraP(2) | 14.3 | | | | | | | | |
| MultiP | | | | | | | | | 20.0 |
| Total RS | 14.3 | 37.5 | 28.6 | 50.0 | 28.6 | 14.3 | 40.0 | 50.0 | 60.0 |
| NP(S-1) | 28.6 | | 14.3 | | 14.3 | 42.8 | | | 20.0 |
| S-1 | 14.3 | 37.5 | 42.8 | 50.0 | 28.6 | | 40.0 | 25.0 | 80.0 |
| S-2 | 14.3 | | | 16.7 | | | | 25.0 | |
| S-3 | | 12.5 | | | | 28.6 | | | |
| S-3/1 | | | | | | | | | |
| S-4 | | | 14.3 | 16.7 | | | 20.0 | | |
| Total NP | 57.1 | 50.0 | 71.4 | 83.3 | 42.8 | 71.4 | 60.0 | 50.0 | 100.0 |

FREQUENCY OF OCCURRENCE OF RESPONSE TYPES
BY AGENCIES FOR CARTOON NO. 15

(expressed as percentages of the total sample with sample size indicated in brackets)

| Agency Response Type | TM (6) | FLU (8) | MLU (7) | Lands (6) | F&W (7) | Parks (7) | IPD (5) | WR (4) | PP (4) |
|----------------------------|-----------|------------|------------|--------------|------------|--------------|------------|-----------|-----------|
| ON(1) | 16.7 | 25.0 | 42.8 | 16.7 | 14.3 | | | | |
| ON(2) | | 12.5 | | | 14.3 | | | | |
| ON(3) | | | | | | | | | |
| ON(4) | | | | | | | | | |
| ON(5) | | | | | | | | | |
| Total ON | 16.7 | 37.5 | 42.8 | 16.7 | 28.6 | - | - | - | - |
| IntroP | | 12.5 | | | | | | | |
| ExtraP(1) | 66.7 | 50.0 | 50.0 | 50.0 | 35.9 | 42.8 | 100.0 | 50.0 | 62.5 |
| ExtraP(2) | | | | 16.7 | 14.3 | 14.3 | | 25.0 | 37.5 |
| ExtraP(3) | 16.7 | 12.5 | 7.1 | 16.7 | 7.1 | | | | |
| Imp | | | | 16.7 | | 14.3 | | 25.0 | |
| Total RO | 83.3 | 75.0 | 57.1 | 100.0 | 57.1 | 71.4 | 100.0 | 100.0 | 100.0 |
| OD | 33.3 | 25.0 | 14.3 | 16.7 | 28.6 | 28.6 | | 50.0 | 25.0 |
| OD(1) | | | | | | | | | |
| OD(2) | | | | | | | | | |
| OD(3) | | | | | | | | | |
| OD(4) | | | | | | | | | |
| OD(5) | | | | | | | | | |
| OD(6) | | | | | | | | | |
| OD(7) | | | | | | | | | |
| Total OD | 33.3 | 25.0 | 14.3 | 16.7 | 28.6 | 28.6 | - | 50.0 | 25.0 |
| IntroP | | 12.5 | 14.3 | 33.3 | 14.3 | 14.3 | 20.0 | | 25.0 |
| ExtraP(1) | 16.7 | | | 16.7 | | 42.8 | 20.0 | | 25.0 |
| ExtraP(2) | | | 14.3 | 33.3 | | | 20.0 | | |
| MultiP | 16.7 | | | | 14.3 | 14.3 | | | 25.0 |
| Total RS | 33.3 | 12.5 | 28.6 | 83.3 | 28.6 | 71.8 | 60.0 | - | 75.0 |
| NP(S-1) | 33.3 | 12.5 | | 50.0 | | | | | 25.0 |
| S-1 | | 12.5 | 28.6 | | 28.6 | 14.3 | 20.0 | | |
| S-2 | | | | | | | | | |
| S-3 | | | 14.3 | | | | | 25.0 | 25.0 |
| S-3/1 | | | | | | | | | |
| S-4 | 33.3 | 25.0 | 28.6 | 33.3 | 28.6 | 42.8 | 80.0 | 25.0 | 25.0 |
| Total NP | 66.7 | 50.0 | 71.4 | 83.3 | 57.1 | 57.1 | 100.0 | 50.0 | 75.0 |

FREQUENCY OF OCCURRENCE OF RESPONSE TYPES
BY AGENCIES FOR CARTOON NO. 16

(expressed as percentages of the total sample with sample size indicated in brackets)

| Agency Response Type | TM (6) | FLU (8) | MLU (7) | Lands (6) | F&W (6) | Parks (7) | IPD (5) | WR (5) | PP (5) |
|----------------------------|-----------|------------|------------|--------------|------------|--------------|------------|-----------|-----------|
| ON(1) | | | | | | 14.3 | | | |
| ON(2) | | | | | | | | | |
| ON(3) | | | | | | | | | |
| ON(4) | | | | | | | | | |
| ON(5) | | | | | | | | | |
| Total ON | - | - | - | - | - | 14.3 | - | - | - |
| IntroP | | 12.5 | | | | | | | |
| ExtraP(1) | 83.3 | 62.5 | 100.0 | 66.7 | 66.7 | 85.7 | 40.0 | 80.0 | 40.0 |
| ExtraP(2) | | | | | | | | | |
| ExtraP(3) | | | | | | | | | |
| Imp | | | | | | | | 20.0 | |
| Total RO | 83.3 | 75.0 | 100.0 | 66.7 | 66.7 | 85.7 | 40.0 | 100.0 | 40.0 |
| OD | 83.3 | 12.5 | 42.8 | 33.3 | 50.0 | 71.5 | 20.0 | 60.0 | 40.0 |
| OD(1) | | | | | | | | | |
| OD(2) | | | | | | | | | |
| OD(3) | | | | | | | | | |
| OD(4) | | | | | | | | | |
| OD(5) | | | | | | | 20.0 | | |
| OD(6) | | | | | | | | | |
| OD(7) | | | | | | | | | |
| Total OD | 83.3 | 12.5 | 42.8 | 33.3 | 50.0 | 71.5 | 40.0 | 60.0 | 40.0 |
| IntroP | 16.7 | 87.5 | | 50.0 | 33.3 | 14.3 | 40.0 | 20.0 | 80.0 |
| ExtraP(1) | 16.7 | | | | 16.7 | | 20.0 | | |
| ExtraP(2) | | | | | | | | | |
| MultiP | | | | | | | | | |
| Total RS | 33.3 | 87.5 | - | 50.0 | 50.0 | 14.3 | 60.0 | 20.0 | 80.0 |
| NP(S-1) | 33.3 | | 14.3 | | | | 20.0 | | |
| S-1 | | 62.5 | | 33.3 | 50.0 | 28.6 | 40.0 | 40.0 | 80.0 |
| S-2 | | 25.0 | 28.6 | | | | | | |
| S-3 | | | 14.3 | | | | | | |
| S-3/1 | | | | | | | | | |
| S-4 | | 12.5 | | 33.3 | 16.7 | | | 20.0 | 40.0 |
| Total NP | 33.3 | 100.0 | 57.1 | 66.7 | 66.7 | 28.6 | 60.0 | 60.0 | 120.0 |

FREQUENCY OF OCCURRENCE OF RESPONSE TYPES
BY AGENCIES FOR CARTOON NO. 17

(expressed as percentages of the total sample with sample size indicated in brackets)

| Agency Response Type | TM (7) | FLU (8) | MLU (7) | Lands (6) | F&W (7) | Parks (7) | IPD (5) | WR (5) | PP (5) |
|----------------------------|-----------|------------|------------|--------------|------------|--------------|------------|-----------|-----------|
| ON(1) | 28.6 | 37.5 | | | | 14.3 | | | |
| ON(2) | 14.3 | 25.0 | | 16.7 | 14.3 | 14.3 | | | |
| ON(3) | | | | | | | 20.0 | | |
| ON(4) | | | | | | | | | |
| ON(5) | | | | | | | | | |
| Total ON | 42.8 | 62.5 | - | 16.7 | 14.3 | 28.6 | 20.0 | - | - |
| IntroP | | | | | | | 20.0 | 20.0 | |
| ExtraP(1) | | 25.0 | 28.6 | | 14.3 | | | | |
| ExtraP(2) | 42.8 | | 71.4 | | | | | | |
| ExtraP(3) | 14.3 | | | | | 14.3 | | | |
| Imp | | | | | | | | | |
| Total RO | 57.1 | 25.0 | 100.0 | - | 14.3 | 14.3 | 20.0 | 20.0 | - |
| OD | 42.8 | 25.0 | 28.6 | | 14.3 | 42.8 | 60.0 | 60.0 | |
| OD(1) | | | | | | | | | |
| OD(2) | | 12.5 | | | | | | | |
| OD(3) | | | | | | | | | |
| OD(4) | | | | | | | | | |
| OD(5) | | | | | | | | | |
| OD(6) | | 12.5 | | | 14.3 | | | | |
| OD(7) | | | | | | | | | |
| Total OD | 42.8 | 50.0 | 128.6 | - | 28.6 | 42.8 | 60.0 | 60.0 | - |
| IntroP | 42.8 | 37.5 | 57.1 | 50.0 | 71.4 | 42.8 | 20.0 | 40.0 | 100.0 |
| ExtraP(1) | | | | | | | | | |
| ExtraP(2) | | | | | | | | | |
| MultiP | | | | | | | | | |
| Total RS | 42.8 | 37.5 | 57.1 | 50.0 | 71.4 | 42.8 | 20.0 | 40.0 | 100.0 |
| NP(S-1) | | | 14.3 | 33.3 | | | 20.0 | | |
| S-1 | 28.6 | 25.0 | 14.3 | 33.3 | 28.6 | 28.6 | | 40.0 | 60.0 |
| S-2 | | | | | | | | | |
| S-3 | 14.3 | 12.5 | | 16.7 | 42.8 | 14.3 | | 20.0 | 40.0 |
| S-3/1 | | | | | | | | | |
| S-4 | | | 57.1 | | | | | | |
| Total NP | 42.8 | 37.5 | 85.7 | 83.3 | 71.4 | 42.8 | 20.0 | 60.0 | 100.0 |

FREQUENCY OF OCCURRENCE OF RESPONSE TYPES
BY AGENCIES FOR CARTOON NO. 19

(expressed as percentages of the total sample with sample size indicated in brackets)

| Agency Response Type | TM (6) | FLU (8) | MLU (7) | Lands (5) | F&W (7) | Parks (6) | IPD (5) | WR (5) | PP (5) |
|----------------------------|-----------|------------|------------|--------------|------------|--------------|------------|-----------|-----------|
| ON(1) | 83.3 | 33.3 | 50.0 | 20.0 | 28.6 | 16.7 | | 20.0 | 20.0 |
| ON(2) | | 66.7 | | 20.0 | | 66.7 | 20.0 | 60.0 | |
| ON(3) | | | | | | | | | |
| ON(4) | | | | | | | | | |
| ON(5) | | | | 40.0 | | | | | |
| Total ON | 83.3 | 100.0 | 50.0 | 80.0 | 28.6 | 83.3 | 20.0 | 80.0 | 20.0 |
| IntroP | | 8.3 | 28.6 | 20.0 | | | 20.0 | 20.0 | |
| ExtraP(1) | | 8.3 | 14.3 | | | | | | 20.0 |
| ExtraP(2) | | | | | | 16.7 | | | |
| ExtraP(3) | 16.7 | 16.7 | | 20.0 | | 16.7 | | | |
| Imp | | 33.3 | | 20.0 | | 33.3 | 20.0 | 20.0 | 20.0 |
| Total RO | 16.7 | 66.7 | 42.8 | 60.0 | - | 66.7 | 40.0 | 40.0 | 40.0 |
| OD | 83.3 | 50.0 | 71.4 | 20.0 | 42.8 | 33.3 | 20.0 | 20.0 | 60.0 |
| OD(1) | | 16.7 | | | 14.3 | | 20.0 | | |
| OD(2) | | | | | | | | | |
| OD(3) | | | | | | | | | |
| OD(4) | | | | | | | | | |
| OD(5) | | | | | | | | | |
| OD(6) | | | | | | | | | |
| OD(7) | | | | | | | | | |
| Total OD | 83.3 | 66.7 | 71.4 | 20.0 | 57.1 | 33.3 | 40.0 | 20.0 | 60.0 |
| IntroP | | | 14.3 | 40.0 | 28.6 | | 40.0 | 20.0 | 20.0 |
| ExtraP(1) | | | | | | | | | |
| ExtraP(2) | | | 14.3 | | | | | | |
| MultiP | | | | | | | | | |
| Total RS | - | - | 28.6 | 60.0 | 28.6 | - | 40.0 | 20.0 | 20.0 |
| NP(S-1) | 16.7 | | | | | | 20.0 | 20.0 | |
| S-1 | | | | 40.0 | 42.8 | | 20.0 | | 20.0 |
| S-2 | | | | | | | | | |
| S-3 | | | 14.3 | 20.0 | | | | | 20.0 |
| S-3/1 | | | 14.3 | | | | | | |
| S-4 | | | | | | | | | |
| Total NP | 16.7 | - | 28.6 | 60.0 | 42.8 | - | 40.0 | 20.0 | 40.0 |

B30045